National Grid Company of Pakistan Limited (NGC)

(Formerly NTDC)

BIDDING DOCUMENT NO.
XEN-EHV-II-NGC-HYD-01-2026

Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro

SINGLE STAGE SINGLE ENVELOPE (SSSE) BIDDING PROCEDURE

August, 2026

Issued to: _____

Payment Mode: _____

Date: _____

Sign & Stamp: _____

INVITATION TO BID

1. National Grid Company of Pakistan (NGC) [*Formerly NTDC*] "the Employer", responsible for development and control of power transmission system in the country, invites sealed bids through "Single Stage Single Envelope Procedure" on National Competitive Bidding (NCB) basis from eligible firms as defined under IB-3 of Instructions to Bidders of the Bidding Documents, registered with Income Tax and Sales Tax Departments and who are on Active Taxpayers List of the Federal Board of Revenue (if applicable) for following scope of work:-

   Scope of Work: Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro

2. Bidding Documents, containing detailed terms and conditions, etc. are available at Office of the **Executive Engineer, TLC Division, EHV-II, NGC of Pakistan**
   Bungalow No. B-2 NTPS Colony, T.M Khan Road,
   Site Area, Hyderabad
   Telephone No. 0335-7401970

3. The Bidder, whether participating as a sole entity, a lead partner of a Joint Venture, or an approved subcontractor, shall demonstrate experience as a main contractor or subcontractor in the successful execution of construction contracts for transmission lines that has Successfully completed at least three (3) contracts within the last fifteen (15) years that involving following criteria (i.e Construction of conventional or pile foundations, Erection of transmission towers, Stringing, testing, and commissioning of transmission lines). Each of the above contracts shall include the mentioned minimum technical requirements (i.e Voltage level of 500 /220 kV, with bundled conductors, A minimum length of 15 kilometers per transmission line, Transmission lines must have been strung using the controlled tension method, The completed transmission lines must have been in successful commercial operation for at least two (2) years prior to the deadline for bid submission).

   If the Bidder is a Joint Venture, then the lead partner shall individually meet the full requirement outlined in above paragraph. Each JV partner, other than the lead partner, must have independently completed, as a main contractor or approved subcontractor, at least three (3) contracts within the last fifteen (15) years that Involving following criteria (i.e Construction of conventional or pile foundations, Erection of transmission towers, Stringing, testing, and commissioning of transmission lines). Each of the above contracts shall include the mentioned minimum technical requirements (i.e Voltage level of 500 / 220 kV, with bundled conductors, A minimum length of 15 kilometers per transmission line, Transmission lines must have been strung using the controlled tension method, The completed transmission lines must have been in successful commercial operation for at least two (2) years prior to the deadline for bid submission).

   - The above contracts may have been executed by the Bidder as a single entity, a JV partner, or as an approved subcontractor, provided proper documentary evidence is submitted.
   - Documentary evidence such as completion certificates, operation records, and client references must be provided to substantiate the above experience.
   - All experience shall be demonstrated with appropriate supporting documents including scope of work, client confirmation, project dates, and voltage level.

4. All Bids must be accompanied by a Bid Security in an amount not less than Rs. 1,000,000 in format prescribed in the Bidding Documents.

5. **ELIGIBILITY & SALE OF TENDER**

   A. Income Tax clearance certificate & return filed with Income Tax Department for financial year 2024-2025.
   B. Registered with Income Tax and Provisional Sales Tax Departments and who are on Active Tax payers List of the Federal Board of Revenue and registered with PEC in appropriate category as per NTDC specifications and renewed / valid up to date in the relevant category with original certificate. (Details, types and quantities mentioned in the bidding document).
   C. A complete set of Bidding documents, in English Language, can be purchased by interested bidder during office hours from o/o Executive Engineer TLC Division EHV-II NGC Hyderabad from the date of publication of NIT on or before one day of opening of tender upon the submission of written request to the Office of Executive Engineer TLC Division EHV-II NGC Hyderabad
   D. Bidding document will be issued only to the proprietor of firm or his legally Authorized representative with CNIC (In original).
   E. All the Govt. taxes (Federal / Provincial) will be applicable as per relevant Govt. Notifications.

6. **CONDITIONS**

   A. NGC will award the contract to the lowest evaluated and technically responsive bidder on overall basis.
   B. The NGC / Employer have the right to reject all bids as per PPRA Rule # 33 (1) of Public Procurement Rules 2004.
   C. Each page of the bidding documents / drawings shall be signed and stamped by the bidder.

7. The Bids prepared in accordance with the instructions in the Bidding Documents must reach at B-2, NTPS Colony T.M Khan Road, S.I.T.E Area Hyderabad - Pakistan on or before **10:00 hours**, Pakistan Standard Time **August 31st, 2026**. The Technical Bids will be opened the same day at **11:30 hours** in the same Room. This advertisement is also available on PPRA website at www.ppra.org.pk

Executive Engineer, TLC Division,
EHV-II NGC of Pakistan Hyderabad
Mob. No. 0335-7401970
E-Mail: xentlc.ehv2@ntdc.com.pk

SECTION-I

INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

INSTRUCTIONS TO BIDDERS

SECTION I

INSTRUCTIONS TO BIDDERS

(Note: These Instructions to Bidders along with Bidding Data will not be part of the Contract and will cease to have effect once the Contract is signed.)

A. GENERAL

IB.1 Scope of Bid

1.1 The Employer as defined in the Bidding Data hereinafter called "the Employer" wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarized in the Bidding Data hereinafter referred to as the "Works".

1.2 The successful bidder will be expected to complete the Works within the time specified in Appendix-A to Bid.

IB.2 Source of Funds

2.1 The Employer has applied for/received a loan/credit from the source (s) indicated in the Bidding Data in various currencies towards the cost of the project specified in the Bidding Data and it is intended that part of the proceeds of this loan/credit will be applied to eligible payments under the Contract for which these Bidding Documents are issued.

IB.3 Eligible Bidders

3.1 This Invitation for Bids is open to all bidders meeting the following requirements:

a. Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the Works.
b. Duly prequalified/enlisted with the Employer.

IB.4 One Bid per Bidder

4.1 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 (other than alternatives pursuant to Clause IB.16) will be disqualified.

IB.5 Cost of Bidding

5.1 The bidders shall bear all costs associated with the preparation and submission of their bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

IB.6 Site Visit

6.1 The bidders are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. All cost in this respect shall be at the bidder's own expense.

6.2 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.

B. BIDDING DOCUMENTS

IB.7 Contents of Bidding Documents

7.1 The Bidding Documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.

1. Instructions to Bidders.
2. Bidding Data.
3. Forms of Bids and schedules to bids
4. Conditions of Contract
5. Specifications - Technical Provisions.
7. Form of Bid & Appendices to Bid.
8. Bill of Quantities
9. Form of Bid Security.
10. Form of Contract Agreement.
11. Forms of Performance Security and Advance Guarantee/Bond.
12. Drawings.

7.2 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 Bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.8 Clarification of Bidding Documents

8.1 Any prospective bidder requiring any clarification (s) in respect of the Bidding Documents may notify the Employer in writing at the Employer's address indicated in the Invitation for Bids. The Employer will respond to any request for clarification which he receives earlier than 10 days prior to the deadline for submission of bids.

Copies of the Employer's response will be forwarded to all purchasers of the Bidding Documents, including a description of the enquiry but without identifying its source.

IB.9 Amendment of Bidding Documents

9.1 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.

9.2 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.

9.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20

C. PREPARATION OF BIDS

IB.10 Language of Bid

10.1 The bid and all correspondence and documents related to the bid exchanged by a bidder and the Employer shall be in the bid language stipulated in the Bidding Data and Particular Conditions of Contract. Supporting documents and printed literature furnished by the bidders may be in any other language provided the same are accompanied by an accurate translation of the relevant parts in the bid language, in which case, for purposes of evaluation of the bid, the translation in bid language shall prevail.

IB.11 Documents Accompanying the Bid

11.1 Each bidder shall:

(a) submit a written power of attorney authorizing the signatory of the bid to act for and on behalf of the bidder;

(b) update the information indicated and listed in the Bidding Data and previously submitted with the application for prequalification, and continue to meet the minimum criteria set out in the prequalification documents which as a minimum, would include the following:

(i) Evidence of access to financial resources along with average annual construction turnover;
(ii) Financial predictions for the current year and the two following years including the effect of known commitments;
(iii) Work commitments since prequalification;
(iv) Current litigation information; and
(v) Availability of critical equipment.

and

(c) furnish a technical proposal taking into account the various Appendices to Bid specially the following:

Appendix-E to Bid	Proposed Construction Schedule
Appendix-F to Bid	Method of Performing the Work
Appendix-G to Bid	List of Major Equipment
Appendix-M to Bid	Organization Chart for Supervisory Staff

and other pertinent information such as mobilization programmeetc;

11.2 Bids submitted by a joint venture of two (2) or more firms shall comply with the following requirements:

(a) the bid and in case of a successful bid, the Form of Contract Agreement shall be signed so as to be legally binding on all partners;
(b) 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;
(c) the partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;
(d) all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para(b) above as well as in the Form of Bid and in the Form of Contract Agreement (in case of a successful bid); and
(e) 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.

11.3 Bidders shall also submit proposals of work methods and schedule, in sufficient detail to demonstrate the adequacy of the Bidders' proposals to meet the technical specifications and the completion time referred to in Sub-Clause 1.2 hereof.

IB.12 Bid Prices

12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole of the Works as described in Sub-Clause 1.1 hereof, based on the unit rates and / or prices submitted by the bidder.

12.2 The bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. 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 Bill of Quantities.

IB.13 Currencies of Bid and Payment

13.1 The unit rates and the prices shall be quoted by the bidder entirely in Pak rupees. A bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as the "Foreign Currency Requirements") shall indicate the same in Appendix-B to Bid. The proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the currency of the Bidder's home country or, (ii) at the bidder's option, entirely in Pak rupees provided always that a bidder expecting to incur expenditures in a currency or currencies other than those stated in (i) and (ii) above for a portion of the foreign currency requirements, and wishing to be paid accordingly, shall indicate the respective portions in his bid.

13.2 The rates of exchange to be used by the bidder for currency conversion shall be the TT&OD Selling Rates published or authorized by the State Bank of Pakistan prevailing on the date 28 days prior to the deadline for submission of bids.

For the purpose of payments, the exchange rates used in bid preparation shall apply for the duration of the Contract.

IB.14 Bid Validity

14.1 Bids shall remain valid for the period stipulated in the Bidding Data after the Date of Bid Opening specified in Clause IB.23.

14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders 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 forfeiting his Bid Security. A bidder agreeing to the request will not be required or permitted to modify his bid, but 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.

IB.15 Bid Security

15.1 Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in the Bidding Data in Pak Rupees or an equivalent amount in a freely convertible currency.

15.2 The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favour of the Employer valid for a period 28 days beyond the Bid Validity date.

15.3 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.

15.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than 28 days after the expiration of the period of Bid Validity.

15.5 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security and signed the Contract Agreement.

15.6 The Bid Security may be forfeited:

(a) if the bidder withdraws his bid except as provided in Sub-Clause 22.1;

(b) if the bidder does not accept the correction of his Bid Price pursuant to Sub-Clause 27.2 hereof; or

(c) In the case of successful bidder, if he fails within the specified time limit to:

(i) furnish the required Performance Security; or

(ii) sign the Contract Agreement.

IB.16 Alternate Proposals by Bidder

16.1 Should any bidder consider that he can offer any advantages 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.

16.2 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.17 Pre-Bid Meeting

17.1 The Employer may, on his own motion 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, is as stipulated in the Bidding Data. All prospective bidders or their authorized representatives shall be invited to attend such a pre-bid meeting.

17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than Seven (07) days before the proposed pre-bid meeting.

17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in Sub-Clause 7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.

17.4 Absence at the pre-bid meeting will not be a cause for disqualification of a bidder.

IB.18 Format and Signing of Bid

18.1 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.

18.2 All appendices to Bid are to be properly completed and signed.

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

18.4 Each bidder shall prepare by filling out the forms completely and without alterations one (1) original and number of copies, specified in the Bidding Data, of the documents comprising the bid as described in Clause IB.7 and clearly mark them “ORIGINAL” and ‘COPY” as appropriate. In the event of discrepancy between them, the original shall prevail.

18.5 The original and all copies of the bid shall be typed or written in indelible ink (in the case of copies, Photostats are also acceptable) and shall be signed by a person or persons duly authorized to sign on behalf of the bidder pursuant to Sub- Clause 11.1(a) hereof. All pages of the bid shall be initialed and stamped by the person or persons signing the bid.

18.6 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.

18.7 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.

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

D. SUBMISSION OF BIDS

IB.19 Sealing and Marking of Bids

19.1 Each bidder shall submit his bid as under:

(a) ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.

(b) The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in Sub- Clause 19.2 hereof.

19.2 The inner and outer envelopes shall:

(a) be addressed to the Employer at the address provided in the Bidding Data;

(b) bear the name and identification number of the contract as defined in the Bidding Data; and

(c) provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data.

19.3 In addition to the identification required in Sub-Clause 19.2 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.21

19.4 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.20 Deadline for Submission of Bids

20.1 (a) Bids must be received by the Employer at the address specified no later than the time and date stipulated in the Bidding Data.

(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. No claims will be entertained for refund of such expenses.

(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.

20.2 The Employer may, at his discretion, extend the deadline for submission of bids by issuing an amendment in accordance with Clause IB.9, 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.21 Late Bids

21.1 (a) Any bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 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 or by mail.

IB.22 Modification, Substitution and Withdrawal of Bids

22.1 Any bidder may modify**,** substitute orwithdraw his bid after bid submission provided that the modification, substitution or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.

22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.

22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with Sub-Clauses 22.1 and 27.2.

22.4 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 in pursuance to Clause IB.15.

E. BID OPENING AND EVALUATION

IB.23 Bid Opening

23.1 The Employer will open the bids, including withdrawals,substitution and modifications made pursuant to Clause IB.22, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the Bidding Data. The bidders' representatives who are present shall sign a register evidencing their attendance.

23.2 Envelopes marked "MODIFICATION", "SUBSTITUTION"or "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.22 shall not be opened.

23.3 The bidder's name, total Bid Price and price of any Alternate Proposal(s), any discounts, bid modifications**,** substitution and withdrawals, the presence or absence of Bid Security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening of bids.

23.4 Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with the Sub-Clause 23.3.

IB.24 Process to be Confidential

24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report which shall be done at least ten (10) days prior to issue of Letter of Acceptance. 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. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the rejection of such bidder's bid. Whereas any bidder feeling aggrieved may lodge a written complaint not later than fourteen (14) days after the announcement of the bid evaluation report; however mere fact of lodging a complaint shall not warrant suspension of the procurement process.

IB.25 Clarification of Bids

25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of his bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with Clause IB.28.

IB.26 Examination of Bids and Determination of Responsiveness

26.1 Prior to the detailed evaluation of bids, the Employer will determine whether each bid is substantially responsive to the requirements of the Bidding Documents.

26.2 A substantially responsive bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; and (iv) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. 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) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.3 If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

IB.27 Correction of Errors

27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

(a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and

(b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.

27.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid Security shall be forfeited in accordance with Sub- Clause 15.6(b) hereof.

IB.28 Evaluation and Comparison of Bids

28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26.

28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

(a) making any correction for errors pursuant to Clause IB.27;
(b) excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Daywork; and
(c) making an appropriate adjustment for any other acceptable variation or deviation.

28.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.

28.4 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 Bill of Quantities 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.32 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.

F. AWARD OF CONTRACT

IB.29 Award

29.1 Subject to Clauses IB.30 and IB.34, 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 eligible in accordance with the provisions of Clause IB.3 and qualify pursuant to Sub-Clause IB 29.2.

29.2 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 therefor in writing. They shall form part of the records of that bid evaluation report.

IB.30 Employer's Right to Accept any Bid and to Reject any or all Bids

30.1 Notwithstanding Clause IB.29, 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 except that the grounds for rejection of all bids 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.

IB.31 Notification of Award

31.1 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 execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Contract Price").

31.2 No Negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted, however, Employer may have clarification meetings to get clarify any item in the bid evaluation report.

31.3 The notification of award 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.

31.4 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.32 Performance Security

32.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Bidding Data and the Conditions of Contract within a period of 14 days after the receipt of Letter of Acceptance.

32.2 Failure of the successful bidder to comply with the requirements of Sub-Clause IB.32.1 or Clauses IB.33 or IB.35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

IB.33 Signing of Contract Agreement

33.1 Within 07 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful bidder the Contract Agreement in the form provided in the Bidding Documents, incorporating all agreements between the parties.

33.2 The formal Agreement between the Employer and the successful bidder shall be executed within 07 days of the receipt of the Contract Agreement by the successful bidder from the Employer.

IB.34 General Performance of the Bidders

The Employer reserves the right to obtain information regarding performance of the bidders on their previously awarded contracts/works. The Employer may in case of consistent poor performance of any Bidder as reported by the employers of the previously awarded contracts, interalia, reject his bid and/or refer the case to the Pakistan Engineering Council (PEC). 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.35 Integrity Pact

The Bidder shall sign and stamp the Integrity Pact provided at Appendix-O 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 bidder non-responsive.

IB.36 Instructions not Part of Contract

Bids shall be prepared and submitted in accordance with these Instructions which are provided to assist bidders in preparing their bids, and do not constitute part of the Bid or the Contract Documents.

SECTION-II

BID DATA SHEET

BID DATA SHEET

The following specific data for the Works to be bided shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

IB 1.1	Name and address of the Employer: Name: **National Grid Company of Pakistan Limited (NGC) [***Formerly NTDC***]** Address: Executive Engineer, TLC Division, EHV-II, NGC of Pakistan, B-2, NTPS Colony T.M Khan Road S.I.T.E Area Hyderabad Telephone No. 92-22-9250133 Mobile No. 0335-7401970
IB 1.1	The bidding is open to National Competitive Bidding (NCB).
IB 1.1	The Name of NCB is:- Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro The identification no. of NCB is: **XEN-EHV-II-NGC-HYD-01-2026** The quoted price must correspond to full scope of work.
IB 2.1	Source of Funding: NGC
IB 3.1 (a)	The Invitation for Bids is open to all bidders in their sole capacity or as joint venture meeting the following requirements: i) The Bidder shall be duly licensed by the Pakistan Engineering Council (PEC) minimum in the relevant category or had applied for renewal of license before submission of its bid. In case of Joint Venture, all the partners shall be duly licensed by PEC and the sum total of the limit of construction cost permitted by the categories of the individual licensees shall not be less than limit of construction cost permitted by the category required here above. ii) The bidder shall be on Active Taxpayers List of the Federal Board of Revenue and relevant Provincial Revenue Authority. iii) The Bidder shall not be blacklisted by NGC/NTDC/WAPDA/DISCOs/any Government/Public department/Donor Agencies at the time of submission of bids. The Bidder should provide details of previous black listing, if any. An affidavit is to be provided by the Bidder that the Bidder is not black listed by NGC/NTDC/WAPDA/DISCOs/ Any Govt. /Public department/Donor Agencies at the time of submission of bids. Further, the bidder shall submit an undertaking along with his bid that he has read and accepts the provisions of NGC/NTDC Policy for Blacklisting of Contractors (copy of policy attached with the bidding documents). Non-submission of this undertaking may result in the rejection of the bid. The undertaking will subsequently become part of the Contract Agreement as well. [Note: NTDC's SOP for blacklisting of Contractors is available in NTDC website for information as to general mechanism. However, this will be strictly interpreted to the extent of the mechanism defined in PPRA Rules (revised 2021) and ITB 38 of Section-II (BDS) of this document.] iv) The bidder shall submit dully filled/complete Beneficial Ownership Declaration Performa as per S.R.O 592(I)/2022 available at https://www.ppra.org.pk/doc/sro592.pdf
IB 3.1(b)	**Qualification of the Bidders:** To be qualified for the award of a contract, the bidder shall meet the qualification criteria delineated herein below: **1. Contractual Experience:** The bidder as a main contractor (as single entity or as JV partner or approved subcontractor) must have substantially completed construction contract(s) of similar nature of following: The Bidder, whether participating as a sole entity, a lead partner of a Joint Venture, or an approved subcontractor, shall demonstrate experience as a main contractor or subcontractor in the successful execution of construction contracts for transmission lines that has Successfully completed at least three (3) contracts within the last fifteen (15) years that involving following criteria (i.e Construction of conventional or pile foundations, Erection of transmission towers, Stringing, testing, and commissioning of transmission lines). Each of the above contracts shall include the mentioned minimum technical requirements (i.e Voltage level of 500 /220 kV, with bundled conductors, A minimum length of 15 kilometers per transmission line, Transmission lines must have been strung using the controlled tension method, The

completed transmission lines must have been in successful commercial operation for at least two (2) years prior to the deadline for bid submission).

*If the Bidder has executed these contract(s) as a JV partner, he shall have carried out all the activities mentioned here before.

*For purpose of this clause, the experience shall be evidenced through Completion Certificates/Taking over Certificates etc. showing substantial completion of works.

If the Bidder is a Joint Venture, then the lead partner shall individually meet the full requirement outlined in above paragraph. Each JV partner, other than the lead partner, must have independently completed, as a main contractor or approved subcontractor, at least three (3) contracts within the last fifteen (15) years that Involving following criteria (i.e Construction of conventional or pile foundations, Erection of transmission towers, Stringing, testing, and commissioning of transmission lines). Each of the above contracts shall include the mentioned minimum technical requirements (i.e Voltage level of 500 / 220 kV, with bundled conductors, A minimum length of 15 kilometers per transmission line, Transmission lines must have been strung using the controlled tension method, The completed transmission lines must have been in successful commercial operation for at least two (2) years prior to the deadline for bid submission).

Supporting documents shall be submitted by the bidder to substantiate the claimed experience.

2. <u>Key Personnel:</u>

The Bidder shall have the personnel for the key positions to be deployed for meeting the following requirements: (Information to be submitted in Appendix-G to Bid given in Section-III of the Bidding Documents).

Electrical and Civil Engineers with valid PEC license having 03 years of relevant experience

The above personnel shall be graduate engineers or equivalent* *[Any relevant qualification may be specified depending upon the role of the person]*.

** Note: The rejection of key personnel shall not result in rejection of the bid, however, bidder shall undertake to replace the key personnel with the acceptable to the Employer in case of award of contract.*

3. <u>Bidder's Financial Capability:</u>

The Employer will take into account the following criteria to verify the financial qualification of the Bidder.

i. The audited Financial "Standalone" Statements (Balance Sheet along with Notes, Profit & Loss Accounts and Cash Flow Statement) audited by Chartered Accountant for the last five (05) years shall be submitted by the Bidder. The Bidder's Financial Statements for the last One year of the audited accounts should show that it has positive "NET WORTH" calculated as a difference between total assets and total liabilities (Information to be submitted in prescribed Form QF-5 of Appendix-N to Bid given in Section-III of the Bidding Documents). In case of JV, each JV partner shall meet the aforementioned criteria.

ii. Minimum average annual turnover of PKR 50.00 Million calculated as best of three years total certified payments received for contracts in progress or completed, within the last 03 years. The average annual turnover may include turnover of affiliates and subsidiaries to the extent of shareholding percentage of the Bidding company provided the turnover is accrued from similar business activity as the Bidding company.
(Information to be submitted in prescribed Form QF-6 of Appendix-N to Bid given in Section-III of the Bidding Documents).

In case of JV, all the JV partners shall combinedly meet the requisite criteria with the lead partner and other partner(s) meeting not less than 40% and 25% respectively of the said criteria.

iii. The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, lines of credit (issued specifically for the project), and other financial means to meet the total cash

	flow demands of this contract which is being considered equal PKR 25.00 Million plus 25% of the Bidder's commitments for running contracts. (Information to be submitted in prescribed Form QF-7 of Appendix-P to Bid given in Section-III of the Bidding Documents). **Notes:** • In case of JV, all the JV partners shall combinely meet the requisite criteria with the lead partner and other partner(s) meeting not less than 40% and 25% respectively of the said criteria. The Bidder shall provide his current work commitments in form QF-4 of Appendix-P to Bid given in Section-III of the Bidding Documents. • The Bidder shall provide his current work commitments in form specified in the Bidding Documents. • The bidder shall provide bank certificate for his lines of credit on the prescribed Form specified in the Bidding Documents. • [Note: Credit Lines submitted after opening of bids shall not be acceptable. Any withdrawal of the credit lines from the bidder's creditors during validity of bid shall be considered a withdrawal of bid.] • The bidder shall provide bank certificate for his lines of credit on the prescribed Form QF-8 of Appendix-P to Bid given in Section-III of the Bidding Documents. In case of more than one Lot(s), Bidder is determined to be lowest evaluated substantially responsive in more than one Lot(s), qualification of the Bidder shall be assessed to meet the aggregate requirements for award of multiple Lots. [If, in this instant, the bidder qualifies for multiple Lots, Purchaser will have right to open price bids for all lots and consider most economical offer/bid/combination at its discretion]. **4. Bidder's Litigation History:** Bidders are required to submit details of all litigation, arbitration and other claims whether pending, threatened or resolved in the last five years. The Employer may disqualify bidder in the event that the total amount of pending or threatened litigation, arbitration or other claims represents fifty percent (50%) of the Bidder's net worth. Details in this regard should be submitted in the prescribed Form QF-6 given in Appendix-G of Bidding Document. The Qualification of the Bidders will be based on meeting the pass/fail criteria as demonstrated by the Bidders' responses in the respective Appendices. The above stated requirements are the minimum and the Employer reserves the right to request for any additional information. The Employer also reserves the right to reject the proposal of any Bidder, if in the opinion of the Employer the qualification details are incomplete, ambiguous or the Bidder is found not qualified to satisfactorily perform the Contract. The above stated Appendices should be completed as per prescribed format and submitted along with required attachments. The missing or incomplete information/documents may render the bid substantially non-responsive. In this regard, the Employer does not have an obligation to request any document/certificates.
IB 3.2	The following sub clause is added after 3.1: A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to: (i) they have controlling shareholders in common; or

	(ii) they receive or have received any direct or indirect subsidy from any of them; or (iii) they have the same legal representative for purposes of this bid; or (iv) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or (v) A Bidder or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the plant and services that are the subject of the bid.
IB 6.1	The Bidder shall inspect the site, examine and obtain all information required and satisfy himself regarding matters and things such as access to site, communication, transport, right of way, the type and number of equipment and facilities required for the satisfactory completion of work, the quantity of various sections of the work, the availability of local labor, availability and rates of materials, local working conditions, uncertainties of weather, obstructions and hindrances that may arise etc., which may affect the work or cost thereof, before submission of his bid. Ignorance of site conditions shall not be accepted by the Employer as basis for any claim for compensation. The submission of a bid by the bidder will be construed as evidence that such an examination was made and any later claims/disputes in regard to rates quoted shall not be entertained or considered by the Employer.
IB 7.2	The Bidders should ensure that they have received the Bidding Documents including Addenda (if any) complete in all respects. The Employer accepts no responsibility for any Bidder lacking a complete set of Bidding Documents including Addenda (if any). The complete Bidding Document including Addenda (if any) will also be available on Employer's website i.e. www.ntdc.com.pk.
IB 8.1	The Sub-Clause 8.1 is amended to the following extent: No request for clarification will be entertained which will be received later than 10 days prior to the date fixed for submission of Bids. The Purchaser's response will be made not later than 7 days prior to the date fixed for submission of Bids. Further, the mere request for clarification from the bidders shall not be a ground for seeking extension in the deadline for submission of Bids.
IB 10.1	The bid with all accompanying documents and all communications in relation to or concerning the bidding Process shall be in **English** language and strictly on the forms provided in the bidding Documents. In case any of these Documents is in another language, it must be accompanied by an accurate translation of the relevant passages in English, in which case, for all purposes of interpretation of the bid, the translation in English shall prevail. Any portions of Bids that are not in English may not be evaluated. Failure to comply with this may disqualify a bid.
IB 11.1	**Documents Comprising the Bid** The Bid submitted by the Bidder shall be comprise of the following documents: a) Duly filled-in Form of Bid along with Appendices to Bid especially the following: (i) Schedule of Prices (ii) Bidder's Qualification Forms (iii) Bid Security as per IB Clause 15.1 (iv) Appendix-A to Bid Special Stipulations (v) Appendix-E to Bid Proposed Construction Schedule (vi) Appendix-F to Bid Method of Performing the Work (vii) Appendix-G to Bid Proposed Personnel (viii) Appendix-H to Bid List of Major Equipment-Related Items (ix) Appendix-J to Bid Organizational Chart of the Supervisory Staff and Labor (x) Appendix-N to Bid Deviations (xi) Appendix-O to Bid Integrity Pact (xii) Appendix-P to Bid Bidder's Qualification Forms

	b) Written Power of Attorney authorizing the signatory of the bid to act for and on behalf of the Bidder; c) Copies of Original Documents defining the constitution or legal status, place of registration and principal place of business of the bidder and JV partners; d) An affidavit that the Bidder has not been blacklisted pursuant to Sub-Clause 3.1(a)(iv); e) An Affidavit that the Bidder has read and accepts NGC/NTDC's SOP for blacklisting of Contractors pursuant to Sub-Clause 3.1(a)(iv) & ITB 38 of Bid Data Sheet of this document; f) Proof of purchase of Bidding Documents from the Employer; g) PEC license pursuant to Sub-Clause 3.1(i); h) Beneficial Ownership Declaration Performa dully filled by the Bidder as per S.R.O 592(I)/2022 available at https://www.ppra.org.pk/doc/sro592.pdf. i) Duly filled-in Form of Price Bid with following Appendices to Bid: i) Appendix-D to Bid Bill of Quantities ii) Appendix-M to Bid Estimated Progress Payments j) Any other document required to be submitted in accordance with these Bidding Documents.
IB 12.3	Add the following new Sub-Clause IB 12.3: The prices quoted by the bidder shall be firm and shall not be adjustable.
IB 13	Clause IB.13 is substituted with the following: "The unit rates and prices shall be quoted by the Bidder entirely in Pak Rupees. All payments under the contract shall be made in Pak Rupees only. Bidders expecting to incur expenditures in currency(ies) other than Pak Rupees shall manage foreign currency(ies) at their own arrangement. The exchange risk in this regard, if any, shall be deemed to be included in unit rates and prices quoted by the Bidder."
IB 14.1	The period for Bid validity shall be minimum Ninety (90) days after the date of Bid opening.
IB 15.1	The amount of Bid Security shall be an amount Rs. 1,000,000 on the prescribed format
IB 15.2	Sub-Clause IB.15.2 is substituted with the following: "The Bid Security shall be, at the option of the Bidder, in the form of Deposit at Call or a Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favor of the Employer on the prescribed Form annexed to these Documents valid for a period 28 days beyond the Bid Validity date. The Bid Security of Joint Venture shall be in the name of Joint Venture submitting the Bid. For avoidance of doubt, a Bid Security issued by a foreign bank but not counter guaranteed by a Scheduled Bank in Pakistan shall not be acceptable and rejected as non-responsive." If a bidder submits a Bid Security that has following discrepancies (to the extent mentioned against each), the Procuring Agency shall request the Bidder to submit a complaint bid security within fourteen (14) days of receiving such request. Failure to provide a complaint bid security within the prescribed period of receiving such a request shall cause the rejection of the bid. Any bid accompanied by bid security with deviation greater than the extent mentioned below shall be rejected: i. Bid Security amount is short within 10% of Bid Security amount; and/or ii. Bid Security validity period is short by a maximum of two days Any changes with respect to format/text which does not hurt the right of employer for encashment of the guarantee and does not limit the obligation of the bidder as required in the Bidding Document/Bid Security Format.
IB 15.6	The following is added at the end of Sub-Clause IB.15.6: "(d) If the Bidder is found involved in corrupt and fraudulent practices."

IB 18.4	Sub-Clause 18.4 is substituted with the following: "Each Bidder shall prepare by filling out the forms completely and without alterations one original set of the Bid as described in IB. 11 and clearly mark "ORIGINAL BID". In addition, the Bidder shall submit one (01) copy of the Bid, clearly marked as "COPY NO 1 - BID". In the event of any discrepancy between the original and the copies, the original shall prevail. The Bidder shall also submit an electronic copy of BOQ on Pen Drive in MS Office (Excel) format and shall enclose in the Bid envelope."
IB.19.1	Sub-Clause 19.1 is substituted by the following: "The Bid (comprising the relevant documents as stated under Sub-Clause IB.11) shall be prepared separately. The ORIGINAL and each COPY of Bid shall be sealed in one envelope marked as such.The outer envelope shall be addressed/identified as given in Sub-Clause 19.2 hereof."
IB 19.2 (a)	Employer's address for the purpose of Bid submission: Executive Engineer, TLC Division, EHV-II, NGC of Pakistan, B-2, NTPS Colony T.M Khan Road S.I.T.E Area Hyderabad Telephone No. 92-22-9250133 Mobile No. 0335-7401970 Email xentlc.ehv2@ntdc.com.pk
IB 19.2 (b)	**Brief Description of Works** **Construction of 500 kV Double Circuit Model Transmission Line in TSG South** Contract Identification No.: **XEN-EHV-II-NGC-HYD-01-2026**
IB 19.2 (c)	Para (c) of Sub-Clause 19.2 is substituted by the following: The outer envelopes and the inner envelopes containing the Bid shall bear a warning not to open before the time and date for the opening of Bids, in accordance with IB 23.1.
IB 20.1 (a)	**Deadline for Submission of Bid:** Date: **August 31st, 2026** Time: **10:00 AM**
IB 20.1	Add the following new Para (d) at the end of Sub-Clause: "(d) Bids submitted through fax or email shall not be considered."
IB.23 23.1	**Bid Opening:** Sub-Clause IB.23.1 is substituted by the following: The Employer shall open the Bids in public at the address, on the date, and time specified herein in the presence of Bidder's designated representatives who choose to attend. The Bidders' representatives who are present shall sign a register evidencing their attendance. Time: **11:30 AM** Date: **August 31st, 2026** Address: Executive Engineer, TLC Division, EHV-II, NGC of Pakistan, B-2, NTPS Colony T.M Khan Road S.I.T.E Area Hyderabad Telephone No. 92-22-9250133 Mobile No. 0335-7401970 Email xentlc.ehv2@ntdc.com.pk
23.2	The Bids will be opened on scheduled date and time in presence of the representative of the bidders who choose to attend. If the Bid is submitted unsealed or found unsealed inside the envelope, the Employer shall reject the entire Bid and record at the time of opening of the Bids.
23.3	First, envelopes marked "WITHDRAWAL" shall be opened, read out, and recorded, and the envelope containing the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out and recorded at bid opening.

23.4	Next, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Bid, if any, shall be opened, read out, and recorded. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.
23.5	Next, outer envelopes marked "MODIFICATION" shall be opened. No Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Bids. Only the Bids, both Original as well as Modification are to be opened, read out, and recorded at the opening.
23.6	All other envelopes holding the Original Bids, except the Bids rejected pursuant to Sub-Clause IB.23.2, shall be opened one at a time, and the following read out and recorded. (a) the name of the Bidder; (b) whether there is a modification or substitution; (c) the Bid Prices, including any discounts, cross discounts and alternative offers; (d) the presence of Bid Security; and (e) any other details as the Employer may consider appropriate. Only Bids and alternative Bids (if allowed under Sub-Clause IB.16 hereof) read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, the Form of Bid is to be initialed by the nominated representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Bids except for late bids, in accordance with IB.21.1.
23.7	The Employer shall prepare a record of the opening of Bids that shall include, as a minimum: the name of the Bidder, the Bid Price, any discounts, cross discounts, any alternative offers and presence of Bid Security. A copy of the record shall be distributed to all Bidders present at the time of Bid opening.
23.8	The Employer will notify Bidders in writing who have been rejected on the grounds of being substantially non-responsive to the requirements of the Bidding Documents and return their Bid Securities.
IB 24.2	Add the following new Sub Clause after IB 24.1: 24.2 Bidders and their respective agents, suppliers, sub-contractors, representatives and anyone else on behalf of the bidder will not communicate or attempt to communicate directly or indirectly with the Employer, including any employees, directors, officers, agents or representatives of any of them during any part of the Competitive Bidding Process, except as expressly directed or permitted by the Employer. Bidders will also not engage in any form of political or other lobbying whatsoever with respect to their Bids, or otherwise attempt to influence the outcome of the Competitive Bidding Process. In the event of any such communications or lobbying, Employer may at any time reject any Bid by that Bidder without further consideration.
IB 25.1	Add the following at the end of Sub-Clause 25.1: The Employer may, at his discretion, ask any Bidder for confirmation/submission of missing information to clarify its Bid. However, the Employer does not have an obligation to request any additional information or clarification with respect to missing or deficient information in a Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered.
IB 25.2	Add the following new Sub-Clause: If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.
IB 26.1	Sub-Clause 26.1 is substituted by the following: "The Employer will determine whether Bid is substantially responsive to the requirements of the Bidding Documents."

IB 26.2	Sub-Clause 26.2 is substituted by the following: "A substantially responsive Bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) meets the qualification criteria delineated at Sub-Clause IB.3A hereof;(iv) has been properly signed; (vi) is accompanied by the required Bid Security; and (vii) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. 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) adoption/rectification whereof would affect unfairly the competitive position of other Bidders presenting substantially responsive bids. Any minor informality or non-conformity or irregularity in a Bid which does not constitute a material deviation may be waived by the Employer, provided such waiver does not prejudice or affect the relative ranking of any Bidder."
IB 26.4	Following Sub-Clauses are added at the end of Sub-Clause 26.3: The Employer may reject any Bid as non-responsive if found materially incomplete, obscure, irregular or omits any material information required to be submitted by the Bidding Documents.
IB 27.3	Following Sub Clause is added after Sub Clause 27.2: If as a result of arithmetic correction, the Bid Price is increased substantially, the Bidder may be asked to increase the amount of its Bid Security accordingly by submitting its amendment within fifteen (15) days from issuing date of such notification. If the Bidder fails to provide the requisite amendment of the Bid Security within the stipulated period, his Bid will be held substantially non-responsive and will be rejected.
IB 28.1	Following Para is added at the end of the Sub-Clause 28.1: "The Works will be evaluated and compared on Lot basis (if applicable)."
IB 28.2	Following Para is added after the Para (c) of IB. 28.2: (d) applying cross discount in case of combination of Lots to arrive at least cost combination
IB 28.4	Following is added at the end of Sub-clause IB 28.4: "or the employer may require the successful Bidder to balance his bid."
IB 28.5	Following new Sub Clause is added after IB 28.4: The Employer will evaluate the Bids, including all clarifications, additional information, modifications and negotiated changes, by applying the Eligibility and Qualification Criteria. Without limiting the particular criteria, the Employer may take into account the following in the Evaluation of Bids: i. Non-performance by a Bidder on previous contracts with Employer or others; ii. The quality of a Bidder's performance on previous contracts with Employer or others; iii. Anticipated or ongoing claims with or in connection with a Bidder; iv. Any security of safety concerns which Employer may have in respect of a Bidder or its facilities, subcontractors or suppliers; v. The results of any interview with a Bidder or supplied references: or vi. Any knowledge of or experience with a Bidder or its principals, directions, officers and employees. The Employer may independently verify any information (including conducting credit, reference and other checks with respect to a Bidder) and consider such findings in its evaluation. Employer is not required to inform Bidders of how Bids were ranked in the evaluation process.
IB 28.6	Add the following new Sub-Clause IB 12.5: The Employer's evaluation of a Bid will exclude and not take into account Provincial sales Tax (PST).

IB 29.1	Add the words "for the respective Lot(s)" after the words "evaluated Bid Price" in 3rd line of this Sub-Clause. Add the following at the end of this Sub-Clause: "Provided further in case a Bidder is determined to be the lowest evaluated substantially responsive in more than one Lot, the aggregate requirements delineated under Sub-Clause IB.3 hereof shall apply."
IB 29.2	Following text is added at the end of Sub Clause 29.2 The Employer reserves the right to assess the capacity and capability of the Bidder, to successfully execute the scope of work covered under the Bidding Documents within stipulated completion period. This assessment may interalia include for (i) document verification; (ii) details of work executed, work in hand, anticipated in future; (iii) details of tools & plant; (iv) availability of requisite key personnel (v) financial resources; (vi) details of quality system in place; (vii) past experience and performance; (viii) customer feedback (ix) Bank's feedback etc.
IB 30.1	The Employer reserves the right to reject any bid on the following accounts, apart from those mentioned in the bidding documents: i. Bidding Documents are not purchased by the bidder. ii. Bid is not received by the due date and time specified. iii. Cost of the bidding documents is not remitted. iv. Bid is not accompanied by Bid security as specified in the document; Bid security is inadequate; Bid guarantee is not in the specified format. v. Bid does not cover the complete scope of work. vi. Bid does not contain all required particulars as per Schedules & Forms prescribed in the bidding documents. vii. Deviations, conditionality or reservations have been introduced to any part of the bidding documents which may not be acceptable to the Employer in its sole discretion. viii. Bidder does not respond promptly and thoroughly to the request for supplementary information required for the evaluation of his Bid. ix. Bid does not meet minimum acceptable standards of completeness, consistency and detail. x. Bid received from any Black listed Firm / Contractor. If at any time it is found that a material misrepresentation of facts is made or uncovered; the information submitted by the bidder concerning his qualification was false and materially inaccurate or incomplete. If the bidder is the Lead Member of a consortium, then the entire consortium may be disqualified/ rejected.
IB 32.1	The Bidder shall furnish an unconditional Performance Security, equal to ten percent (10%) of the Contract Price in the form prescribed in the conditions of Contract within a period of 14 days after the issuance of Letter of Acceptance/Notice of Award.
IB 33	Text of Clause IB.33 is deleted and substituted as follows: Within seven (07) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the successful bidder shall depute its representative duly authorized for formal signing of the Contract Agreement, Form of which is provided in the Bidding Documents.

Annexure - 1 to Bidding Data Sheet

FORMAT FOR POWER OF ATTORNEY FOR SIGNING OF BID

POWER OF ATTORNEY

Know all men by these presents, we _____(name and address of the registered office of the Bidder) do hereby constitute, appoint and authorize Mr. / Ms. _____R/o _____(name and address of residence) who is presently employed with us and holding the position of _____, as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to the bid of the (please state the name and address of the bidder) for Bidding Document No. **Tender No. XEN-EHV-II-NGC-HYD-01-2026: Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro** (the "tender"), including signing and submission of all documents and providing information / responses to National Grid Company of Pakistan [NGC] (Formerly NTDC), representing us in all matters in connection with our bid for the said tender.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and agree that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

For

(Signature)
(Name, Title, Email ID and Address)

Accepted
…….(Signature)
(Name, Title, Email ID and Address of the Attorney)

ACKNOWLEDGMENT

Before me, a Notary Public for and in the City of _____, this _____ of _____ 2025 personally came and appeared:

NAME IDENTIFICATION DOCUMENT
_____ _____

Known to me to be the same person/s who executed the foregoing Special Power of Attorney in favor of _____, and acknowledged to me the same is/are his/her/their free and voluntary act and deed.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal, the date and place above written.

NOTARY PUBLIC

Annexure - 2 to Bidding Data Sheet

A.FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS

(On Company's Letter Head)

THIS JOINT DEED OF UNDERTAKING executed on this…… day of…….. Two Thousand and …….....by……. a company incorporated under the laws of ……and having its Registered Office at..... (hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s……a company incorporated under the laws of…… and having its Registered Office at…… (hereinafter called the "Party No.2" which expression shall include its successors, executors and permittedassigns) and M/s.. .. .. .a Company incorporated under the laws of…….. and having its Registered Office at……. (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract"{in case of award)] against the Identification No…….for _____ associated with _____ of ……. (hereinafter called the "**Employer**").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated..... AND WHEREAS the Employer invited bids for the Dismantling of Erected Tower material stipulated in the Bidding Document under _____ _____ associated with _____.

AND WHEREAS Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 26 of ITB), and technical provisions forming part of the bidding documents, inter-alia, stipulates that an Undertaking of two or more qualified partners, meeting the requirements of 'Qualification & Evaluation Requirement of the Bidder', as applicable may bid, provided, the Joint Venture fulfills all other requirements under Clause 2, 13, 24 & 26 of ITB and in such a case, the Letter of Bids (Bid Form) shall be signed by the Partner –In Charge so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

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

AND WHEREAS the bid is being submitted to the Employer vide proposal No……..dated….. by Party No.1 based on this Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Clause 2, 13, 24 & 26 (Section-ITB) has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

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

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

2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.

3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding

against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.

4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.

5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in Annexure attached with this undertaking. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.

6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract if awarded and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.

7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.

8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.

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

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

Common Seal of ……. has been affixed in my/ our presence pursuant to Board of Director's Resolution dated …….	For Lead Partner (Party No.-1) For and on behalf of M/s ……..
Name ……..	
Designation …….	
Signature …….	(Signature of the authorized representative)
WITNESS :	
I. ……	
II. ……	
Common Seal of ……. has been affixed in my/ our presence pursuant to Board of Director's Resolution dated …….	For Party No.-2 For and on behalf of M/s…….. (Signature of the authorized

representative)

Name ……..

Designation …….

Signature …….

WITNESS :

I. ……

II. ……

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

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

Name ……..

Designation …….

Signature …….

(Signature of the authorized representative)

WITNESS :

I. ……

II. ……

Notes:

1. In the event that the successful Bidder is a joint venture formed of two or more companies, the Employer requires that the parties to the joint venture accept joint and several liabilities for all obligations under the Contract.
2. The maximum number of J.V partners is three (03).

Annexure - 3 to Bidding Data Sheet

B.FORM OF LETTER OF INTENT BY JV PARTNERS TO ENTER INTO JV AGREEMENT

THIS LETTER OF INTENT signed on this……. day of…….. Two Thousand and …….....by……. a company incorporate under the laws of …… and having its Registered Office at..... (hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s……a company incorporatedunder the laws of…… and having its Registered Office at…… (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s.. .. .. a Company incorporated under the laws of …….. and having its Registered Office at……. (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award)] against the Specification No……for _____ associated with _____ of …….. (hereinafter called the "**Employer**").

WHEREAS the Party No.1, Party No.2 and Party No.3 intend to enter into a Joint Venture Agreement

AND WHEREAS the Employer invited bids as per the above mentioned Specification for the Dismantling of Erected Tower material stipulated in the Bidding Document under _____ associated with _____.

AND WHEREAS Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 26 of ITB), and technical provisions forming part of the bidding documents, inter-alia, stipulates that two or more qualified partners, meeting the requirements of Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 26 of ITB), as applicable may bid, provided, they submit a Letter of Intent to enter into Joint Venture Agreement and the Joint Venture Partners fulfill all other requirements under Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 26 of ITB), and technical provisions forming part of the bidding documents and in such a case, the Letter of Bid (Bid Form) shall be signed by all the proposed partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract by entering into Joint Venture Agreement as per proforma specified in this Section IV. Bidding Forms of the Bidding Documents which will be legally binding on all partners and all obligations hereunder.

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

AND WHEREAS the bid is being submitted to the Employer vide proposal No……..dated…... by Party No.1 based on this Letter of Intent between all the parties; under these presents and the bid in accordance with the requirements of Clause 4.1, Section-ITB and 'Qualification Requirement of the Bidder', Section-Evaluation and Qualification Criteria, has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSED AS UNDER:

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

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s…… the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, manufacture, Supply, and successful performance of the equipment in accordance with the Contract for which we shall enter into Joint Venture Agreement as per proforma specified in this Section IV. Bidding Forms of the Bidding Documents which will be legally binding on all partners:

2. If the Contract is awarded to Joint Venture then in case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) will be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.

3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents will promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.

4. The financial liability of the Parties of the Deed of Undertaking to the Employer in the event of award of Contract on the Joint Venture, with respect to any of the claims rising out of the performance or non-performance of the obligations set forth in the Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of the Deed of Undertaking.

5. It is expressly understood and agreed between the Parties to this Letter of Intent that the responsibilities and obligations of each of the Parties shall be as delineated in Annexure attached with this Letter of Intent. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract in the event of award on Joint Venture.

6. It is also understood that this Letter of Intent is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract if awarded and that this Letter of Intent shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Letter of Intent or on the Joint Venture, other than the express provisions of the Contract.

7. This Letter of Intent shall be construed and interpreted in accordance with the provisions of the Contract.

8. In case of an award of a Contract, we the parties to this Letter of Intent do hereby agree that we shall enter into Joint Venture Agreement as per proforma specified in this Section IV. Bidding Forms of the Bidding Documents which will be legally binding on all partners and we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.

9. It is further agreed that this Letter of Intent shall be irrevocable and shall form an integral part of the bid. It shall be effective from the date first mentioned above for all purposes and intents.

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

Common Seal of ……. has been affixed in my/ our presence pursuant to Board of Director's Resolution dated …….	For Lead Partner (Party No.-1) For and on behalf of M/s ……..
Name …….. Designation ……. Signature …….	(Signature of the authorized representative)
WITNESS :	

I. ……

II. ……

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

Name ……..

Designation …….

Signature …….

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

(Signature of the authorized representative)

WITNESS :

I. ……

II. ……

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

Name ……..

Designation …….

Signature …….

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

(Signature of the authorized representative)

WITNESS :

I. ……

II. ……

Notes:

1. In the event that the successful Bidder is a joint venture formed of two or more companies, the Employer requires that the parties to the joint venture accept joint and several liabilities for all obligations under the Contract.
2. The maximum number of J.V. partners is three (3).

SECTION-III

FORMS OF BID AND APPENDICES

Form of Bid

Bid Reference No. _____

_____

_____

(Name of Contract/Works)

To:

_____

_____

_____

We, the undersigned, declare that:

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract, Contract Data, Specifications, Drawings, if any, 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 Pakistan hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto for the Total Bid Price of Rs_____(Rupees_____) or such other sum as may be ascertained in accordance with the said Documents.
2. We Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of **90 days** from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
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 your favour or made payable to you and valid for a period of twenty eight (28) days beyond the period of validity of Bid.
4. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the Works comprised in the Contract within the time(s) stated in Contract Data.
5. We agree to abide by this Bid for the period of _____ 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.
6. 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.
7. We undertake, if our Bid is accepted, to execute the Performance Security referred to in Conditions of Contract for the due performance of the Contract.
8. We understand that you are not bound to accept the lowest or any bid you may receive.
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.

Dated this_____day of _____, 2026

Name…….....

In the capacityof….....…….

Signed…….....

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

Date..... .....

Address……..

Email……

Witness:

(Signature)_____
Name:_____
Address: _____
_____

APPENDIX – A TO BID

SPECIAL STIPULATIONS
Clause
Conditions of Contract

1.	Engineer's Authority to issue Variation in emergency	2.1	In accordance with National Grid Company of Pakistan (NGC) BOFP.
2.	Law Applicable	5.1(b)	The law to be applied is the law of Islamic Republic of Pakistan.
3.	Amount of Performance Security	10.1	10% of Contract Price stated in the Letter of Acceptance.
4.	Time for Furnishing Program	14.1	Within 30 days from the date of receipt of Letter of Acceptance.
5.	Minimum amount of third party Insurance	23.2	Rs. 1,000,000 (one million) per occurrence with number of occurrences unlimited.
6.	Time for Commencement	41.1	Within Seven (07) days from signing of the Contract Agreement.
7.	Time for Completion	43.1, 48.2	120 days from the date of Commencement.
8.	a) Amount of Liquidated Damages	47.1	0.25% for each day of delay in completion of the Works subject to a maximum of 10% of Contract Price stated in the Letter of Acceptance.
	b) Amount of Bonus	47.3	Not Applicable
9.	Defects Liability Period	49.1	180 Days from the effective date of Taking Over Certificate
10.	Percentage of Retention Money	60.2	10% of the amount of First and Final Invoice. 50% retention money/security will be released to the contractor after issuance of completion certificate and remaining 50% security will be released upon issuance of DLC certificate.
11.	Limit of Retention Money	60.2	10% of Contract Price stated in the Letter of Acceptance.
12.	Minimum amount of Interim Payment Certificates (Running Bills)	60.2	Not Applicable
13.	Time of Payment from delivery of Engineer's Interim Payment Certificate to the Employer.	60.10	Not Applicable
14.	Mobilization Advance * (Interest Free)	60.12	Not Applicable

Appendix-B to Bid

BILL OF QUANTITIES
A. Permeable

General

1. The Schedule of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings. The Schedules do not generally give a full description of the Services to be performed under each item. Bidders shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

2. If bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with IB 8 prior to submitting their bids.
3. The quantities given in the Schedule of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Schedule of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix in accordance with provisions of the Contract.
4. The rates and prices entered in the priced Schedule of Quantities shall, except insofar as it is otherwise provided under the Contract include all costs of Contractor's plant, labor, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore, all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
5. A rate or price shall be entered against each item in the priced Schedule of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Schedule of Quantities.
6. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Schedule of Quantities, 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.
7. General directions and description of work and materials are not necessarily repeated nor summarized in the Schedule of Quantities. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the priced Schedule of Quantities.
8. Provisional sums if included and so designated in the Schedule of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Conditions of Contract.

Units & Abbreviations

9. Units of measurement, symbols and abbreviations expressed in the Bidding Documents shall comply with the System International Unites (SI Units).

10. The following abbreviations shall be used in the Price Schedules:

Abbreviation

Pakistani Rupees	PKR
Number	No.
Kilometre	km
Kilogram	kg
Cubic Meter	Cu.m
Provisional Sums	PS
Percent	%
Quantity	Qty

Pricing

11. Prices shall be filled in indelible ink, and any alterations necessary due to errors, etc., shall be initialed by the Bidder.
12. As specified in the Bid Data Sheet prices shall be subject to adjustment in accordance with the corresponding Appendix-E to Price Bid (Price Adjustment) to the Contract Agreement.
13. For each item, bidders shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules. Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section 6 (Employer's Requirements), Technical Specifications, Drawings or elsewhere in the Bidding Documents.
14. The TOTAL for each Schedule and TOTAL of the Grand Summary shall be deemed to be the total price for executing and completing the Facilities in accordance with the Contract, whether or not each individual item has been priced.
15. When requested by the Employer for the purposes of making payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.
16. Except as otherwise expressly provided under the Conditions of Contract, the unit rates and lump sum amounts entered in the Price Schedules will be the rates at which the Contractor will be paid, and shall be deemed to include for the full scope and all costs incurred by the Contractor in the performance of the Facilities, the provision of services including his overheads, income tax, super tax, other indirect costs, profits and costs of accepting the general risks, liabilities and obligations set forth or implied in the Contract, except for such costs which are specified as reimbursable under the Contract.
17. Arithmetic errors will be corrected by the Employer as per ITB 31.
18. Price of any other item not specifically covered in the Price Schedules but is required for the completion, commissioning and operation of the overhead transmission line shall be deemed to be included in the Schedule of Quantities.
19. The Contractor of any Lot may be required by the Engineer/Employer to carry out foundation /installation work on any location falling in any other Lot.
20. The Contractor shall take all the safeguards at site for safety/security of men, material and machinery at his own responsibility and cost.

Appendix-C to Bid

SCHEDULE OF PRICES / BILL OF QUANTITIES (BOQ)

Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro

SCHEDULE – 1

Sr. No.	Descriptions of Item/work		Unit	Quantity	Unit Rate	Total Amount (Rs.)
1	2		4	5	6	(7=5X6)
A	**Foundations**					
	Reinforced Concrete Spread Foundations in hard rock complete with supply of materials including excavation, blasting (if required), leveling, grading of tower site, cutting, shuttering, reinforcement, concreting (Cement Conform to ASTM C-150 Type-V), curing, bitumen coating dewatering, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead) and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications:					
	a.	Foundation Type D3 (Dry) as per Drawning No. TDD (Complete Foundation 4 Legs) as per Drawing No. 4791/169/TLS/-18-2024/TD/01G012/D3	Nos.	2		
	b.	Foundation Type D2 (Dry) as per drawning No. TDS (Complete Foundation 4 Legs) as per Drawing No. 4791/169/TLS/-18-2024/TD/01G010/D2	Nos.	1		
	Sub-Total A:					
B	**Erection of Steel Towers**					
		Transport and install 500 kV Double Circuit Tower Type 'TDS' & 'TDD' with all accessories i.e anti climbing devices, aerial markers number plates, danger signs , phase plates etc in accordance with the requirement of bidding documents	Ton	158		
		Welding of erected tower bolts and nuts after final inspection up to height of 8.0 m from top of foundation chimney as per specification and supply of zinc primer, enamel paint and application of one coat of zinc rich enamel paint including all lead lift labor etc complete	Each Tower	3		
	Sub-Total B:					

C	**Stringing of Conductor with OPGW (with associated equipment)**					
		Transport and install (by control tension) 927.2 KCM AAAC "Greely Conductor" for quad conductor configration, insulator hanging, hardware assemblies, jumpering accessories & dampers etc complete in all respects as Per specifications & approved drawings and methodology	Km	0.12		
		Transport and install Alumoweld shieldwire including hardware assemblies & dampers etc complete in all respects as Per specifications & approved drawings and methodology	Km	0.12		
		Transport and install OPGW including installation of drop down lengths for jointboxes at the towers alongwith allied hardware including hardware assemblies, joint box accessories & dampers etc complete in all respects with end to end testing of OPGW as Per specifications & approved drawings and methodology	Km	0.12		
	Sub-Total C:					
Total Schedule 1 (A+B+C)						

Note:

1. The quantities given in the BOQ are tentative/estimate and shall be finalized by Engineer according to the site requirements and may increase or decrease. The payment shall be made for actual quantities according to unit rates given in BOQ.
2. During construction, contractor will ensure safety to his workers/labours and any other material.
3. The above shall be carried out strictly in accordance with Technical Specifications.

_____
Name & Seal of Bidder

ABSTRACT OF COST

Sr. No	Description	Amount (Rs.)
Schedule 1	Cost of Construction of 500 kV Model Transmission Line	
	Sub-Total	
	Sales/Service Tax	
	Total (inclusive of all taxes)	

_____

Sign & Stamp

Appendix-D to Bid

Sheet 1 of 2

PROPOSED CONSTRUCTION SCHEDULE

Pursuant to Sub-Clause 43.1 of the General Conditions of Contract, the Works shall be completed on or before the date stated in Appendix-A to Bid. The Bidder shall provide as Appendix-E to Bid, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete the Works including the activities like mobilization, survey for stalking, Civil Works (Foundations), Dismantling & Erection of Towers, Dismantling & Stringing, OPGW Splicing, testing and commissioning of Works to be executed under the Contract. It shall include but not limited to the following:

Sr. No.	Description of Work	Period in days from the effective date of contract
1.	Establishment of site office	
2.	Construction of foundation of Towers	
	a) Commencement	
	b) Completion	
3.	Erection of Towers	
	a) Commencement	
	b) Completion	
4.	Stringing	
	a) Commencement	
	b) Completion	
5.	Testing & Commissioning	
	a) Commencement	
	b) Completion	

To provide the accumulative effective of the activities per month, the bidder shall also provide the graph/ chart as following:

Sr. No.	Description	Days				
1.	Signing of contract	15	30	60	90	120
2.	Effective Date					
3.	Mobilization					
4.	Civil Works (Foundations)					
5.	Erection of Towers					
6.	Stringing					
7.	Testing & commissioning					

The proposed program of Works shall base on the Schedule of Implementation (60 days) as per Bidding Documents.

Note: The bidder shall also indicate the construction crews employed to achieve the completion target for the following:

Type of Crews	No. of Crew employed	Expected Progress/month/crew*
Foundation Crew		
Piling Crew (If Applicable)		
Erection Crew		
Dismantling Crew		
Stringing Crew		

*Mention the required time per tower of a crew to complete a certain activity e.g., foundation & dismantling etc.

METHOD OF PERFORMING THE WORK

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

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.

2. 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.

3. The method of executing the Works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.

4. Quality control / Quality assurance measures to be adopted including procedures to be followed for carrying out all tests required under specifications.

Personnel

Form PER – 1: Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section 2. The data on their experience should be supplied using the Form below for each candidate.

1.	**Title of position**
	Name
2.	**Title of position***
	Name
3.	**Title of position***
	Name
4.	**Title of position***
	Name
5.	**Title of position***
	Name

Form PER – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Fields with asterisk (*) shall be used for evaluation.

Position*		
Personnel information	**Name**	**Date of birth**
	Professional qualifications	
Present employment	**Name of employer**	
	Address of employer	
	Telephone	**Contact (manager / personnel officer)**
	Fax	**E-mail**
	Job title	**Years with present employer**

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From*	To*	Company, Project, Position and Relevant Technical and Management Experience*

Appendix-G to Bid

EQUIPMENT

Form EQ – 1: List of Major Equipment – Related Items

The Bidder will provide on Sheet 2 of this Appendix a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the Works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications. The list of major equipment for construction works of the project should be addressed under the following categories:

a) Right of way
b) Survey for staking
c) Foundation work
    i) For dry foundation crew
    ii) For crew working in water logged area (If applicable)
d) Pile work/Pile Caps with Beams (If applicable)
e) Erection works
f) Dismantling of Existing Conductor, Shield wire & associated hardware etc.
g) Conductor & Sheild wire Stringing
h) Any other

Form EQ – 2: List of Major Equipment

Owned Purchased or Leased	Description of Unit (Make, Model, Year)	Capacity HP Rating	Condition	Present Location or Source	Date of Delivery at Site	Period of Work on Project
1	2	3	4	5	6	7
A) Survey for staking **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
B) Foundation work* **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
C) Pile work/Pile Caps with Beams **(If Applicable)** **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
D) Erection works **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
E) Conductor stringing **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						

* Foundation work will involve both dry type foundation and water logged foundation equipment.

CONSTRUCTION CAMP AND HOUSING FACILITIES

The Contractor in accordance with Clause 34 of the Conditions of Contract shall provide description of his construction camp's facilities and staff housing requirements.

The Contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the Contractor's construction camp.

The Bidder shall list or explain his plans for providing these facilities for the service of the Contract as follows:

(a) Site Preparation (clearing, land preparation, etc.).

2. Provision of Services.

a) Power (expected power load, etc.).

b) Water (required amount and system proposed).

c) Sanitation (sewage disposal system, etc.).

3. Construction of Facilities

a) Contractor's Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).

b) Warehouses and Storage Areas (area required, type of construction and layout).

c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.).

4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).

5. Other Items Proposed (Security services, etc.).

6. Detail of testing Lab with testing equipment etc.

Appendix-I to Bid

ORGANIZATION CHART

FOR THE
SUPERVISORY STAFF AND LABOR

LIST OF SUBCONTRACTORS

I/We intend to subcontract the following parts of the Work to subcontractors. In my/our opinion, the subcontractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the Contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

Part of Works (Give Details)	**Subcontractor (With Complete Address)**
1	**2**

Appendix-K to Bid

SOURCES OF MATERIAL
LIST OF MATERIALS LIKE CEMENT, REINFORCING STEEL

The bidder shall list in this Schedule the names of materials forming part of tower foundations such as cement, reinforcing steel which he intends to procure in connection with this Contract along with the names and complete addresses of the sources.

Name of Goods/Material/ Equipment	Name of Factory	Address

Use additional sheets if required.

Appendix-L To Bid

ESTIMATED PROGRESS PAYMENTS

Bidder's estimate of the value of work which would be executed by him during each of the periods stated below, based on his Program of Works and the Rates in the Schedule of Prices,

Period	**Amounts (Rs.)**
1st Month	
2nd Month	
Total Bid Price	

Initials of Signatory to Bid: ……

Appendix-M to Bid

DEVIATIONS

Form D1-Deviations from Contractual Conditions

Deviations if any, which the bidder has taken to the Contractual Conditions in preparation of his bid, must be listed below.

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

Note: Attach additional sheets, if necessary.

Form D2-Deviations from Technical Conditions

Deviations if any, which the bidder has taken to the Technical Provisions in preparation of his bid, must be listed below.

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

Note: Attach additional sheets, if necessary.

Appendix-O to Bid

INTEGRITY PACT

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS 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 any other 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]

Appendix-P to Bid

BIDDER'S QUALIFICATION FORMS

QF-1	General Information
QF-2	Construction Experience
QF-3	Performance Certificate
QF-4	Current Contract Commitments
QF-5	Financial Data
QF-6	Annual Turnover Data
QF-7	Financial Resources
QF-8	Bank Certificate
QF-9	Pending Litigation

Note:-

1. These forms shall be filled up and furnished by the Bidder and its Joint Venture partner(s), if any.
2. If necessary, additional sheets may be added to the forms. Each page of each form should be clearly marked in the right top corner as follows: Form QF1, page 1; Form QF1, page 2, etc.
3. Some forms will require attachments. Such attachments should be clearly marked as follows: Attachment 1 to Form QF1, Attachment 2 to Form QF1, etc.

Form QF-1: General Information

Bidder and its Joint Venture Partner(s) and/or Subcontractors are requested to complete the information in this form. Nationally information of Bidders should also be provided.

1.	Name of Bidder	
2.	Head office address	
3.	Local office address (if any)	
4.	Telephone	Contract
5.	Facsimile	e-mail
6.	Place of incorporation/registration	Year of incorporation/registration
7.	Main lines of Business 1. 2. 3. 4.	 Since: Since: Since: Since:

Note:
Copies of following credentials shall be attached:

(a) Copy of incorporation/registration certificate
(b) Organization chart
(c) PEC registration certificate in the appropriate category

Signature and Seal of Bidder:

Form QF-2: Construction Experience

Note: To be filled in accordance with criteria described in clause IB3.1 (b) Section-II of the bidding documents

(For a period of Last 10 Years)

Name of the Project: ……..

Order Placed by (full address of Employer)	Order No. and date	Description of Works	Value of order	Date of completion as per contract	Date of actual completion	Remarks indicating reasons for late completion, if any	Has the project been running satisfactorily ? (Attach a certificate from the Employer)	Contact person along with Telephone No., Fax No. and email address

Signature and Seal of the Bidder……

Place:

Date:

Form QF-3: Performance Certificate

(To be issued on the Letter Head of Issuing Authority)

It is to certify that M/s._____ has conducted the following works against mentioned project.

Sr.No.	Contract No. & Date	Designation & address of order placing authority/User	Name of Project	Description of Works	Date of Completion	Work Performance

The above services/Works have been performed against our Project and their performance is found satisfactory.

Date of issuing _____

Signature of issuing authority with seal
Name and designation of issuing authority
Address along with Email, Phone No. and
Fax of issuing authority

Note:

i. In case of those bidders who have provided services to NTDC shall furnish the details of such works in the above Performa which shall be signed by their authorized signatory along with seal and certificate is not required from the Employer in this respect.

ii. In case the performance certificate is not verifiable through the given contact address and email, the bid may be rejected.

Form QF-4: Current Contract Commitments

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

Sr. No.	Particulars of works executed	Contract No. & Date	Name of Contract placing Authority	Ordered Value (PKR)	Value of balance work (PKR)
1	2	3	4	5	6
2					
3					
4					
5					
6					
7					

Signature & Seal of the bidder:

Form QF-5: Financial Data

Financial Data for Previous 3 Years			
Particular			
Total Assets			
Total Liabilities			
Net Worth			
Current Assets			
Current Liabilities			
Information from Income Statement			
Total Revenues			
Profits Before Taxes			
Profits After Taxes			
Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last three years, as indicated above, complying with the following conditions.			
• All such documents reflect the financial situation of the Bidder and not sister or parent companies. • Historic financial statements must be audited by a certified accountant. • Historic Financial statements must be complete, including all notes to the financial statements. • Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).			

Signature and Seal of the bidder:

Form QF-6: Annual Turnover Data

Name of Bidder/Joint Venture Partner:

Bidder and its Joint Venture Partner(s) are requested to complete the information in this form separately. The information supplied should be the annual turnover of the Bidder, in terms of the amounts billed to clients for each year for work in progress or completed. In case of a joint venture, a copy of the Joint Venture Agreement must be attached. The Average Annual Turnover may include turnover of affiliates and subsidiaries to the extent of shareholding percentage of the Bidding company provided the turnover is accrued from similar business activity as the Bidding company. Average Annual Turnover will be considered on "Net Sales" i.e. without Sales tax, discounts etc.

Use a separate sheet for bidder and its Joint Venture partner(s).

Annual turnover data for the following last three fiscal years			
Year	**Amount Currency**	**Exchange Rate**	**Equivalent Amount (in the currency of Bid)**
		Average Annual Turnover	

Signature and Seal of Bidder:

Form QF-7: Financial Resources

Specify proposed sources of financing, such as liquid assets, lines of credit, and other financial means, available to meet the total construction cash flow demands of the subject contract.

Financial Resources		
Sr. No.	Source of Financing	Amount
1.		
2.		
3.		
4.		

Signature and Seal of Bidder:

Form QF-8: Bank Certificate

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

If the contract for the work, namely,…… is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs…… to meet their working capital requirements for executing the above contract.

Signature of Senior Bank Manager:_____
Name of the Senior Bank Manager:_____
Address of the Bank:_____

Stamp of the Bank

Note: Certificate should be on the letter head of the bank.

- **Change the text as follows for Joint Venture:**

This is to certify that M/s……..…… who has formed a JV with M/s……and M/s……..for participating in this bid, is a reputed company with a good financial standing.

If the contract for the work, namely…… is awarded to the above Joint Venture, we shall be able to provide overdraft/credit facilities to the extent of Rs…… to M/s…….. to meet the working capital requirements for executing the above contract.

[This should be given by each of the JV members in proportion to their financial participation.]

Form QF-9: Pending Litigation

Each Bidder or member of a JV must fill in this form

Pending Litigation					
Year	Name of Other Party(s)	Matter of Dispute	Litigation where (Court/ arbitration)	Amount involved	Value of pending claim as a %age of net worth

Signature and Seal of the bidder:

Appendix-Q to Bid

UNDERTAKING OF BID SECURITY
(To be Submitted on a Non-Judicial Stamp Paper)

We _____ (name of Bidder) undertake that Bid Security in accordance with Clause IB-19 of the bidding document is enclosed with our Price bid.

Signature and Seal of the Bidder:

Form QF-4: Pending Litigation

Each Bidder or member of a JV must fill in this form

Pending Litigation					
Year	Name of Other Party(s)	Matter of Dispute	Litigation where (Court/ arbitration)	Amount involved	Value of pending claim as a %age of net worth

Signature and Seal of the bidder:

STANDARD FORMS

FORM OF BID SECURITY
(Bank Guarantee)

Guarantee No._____
Executed on _____

(Letter by the Guarantor to the Employer)

Name of Guarantor (ScheduledBank in Pakistan) 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 anddated 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 of twenty eight (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 16.4 (b) of Instructions to Bidders, or

(c) failure of the successful bidder to

(i) furnish the required Performance Security, in accordance with Sub-Clause IB-21**.**1 of Instructions to Bidders, or

(ii) sign the proposed Contract Agreement, in accordance with Sub-Clauses IB-20.2 & 20.3 of Instructions to Bidders,

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

NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract Agreement with the said Employer in accordance with his Bid as accepted and furnish within fourteen (14)days of receipt of Letter of Acceptance, 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 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 bounded 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:

1. _____

_____
Corporate Secretary (Seal)

2. _____

_____
(Name, Title & Address)

1. Signature _____
2. Name _____
3. Title _____

Corporate Guarantor (Seal)

FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

Guarantee No._____
Executed on _____

(Letter by the Guarantor to the Employer)

Name of Guarantor (Scheduled Bank in Pakistan) with address:_____

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 the 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 9, Remedying Defects, 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, for 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 bounded 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 (Bank)

Witness:

1. _____

_____
Corporate Secretary (Seal)

2. _____

_____
(Name, Title & Address)

1. Signature _____

2. Name _____

3. Title _____

_____
Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of _____ 20 _____ between _____(hereinafter called the "Employer") of the one part and _____ (hereinafter 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 witnesseth 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 Letter of Acceptance;
   (b) The completed Form of Bid along with Schedules to Bid;
   (c) Conditions of Contract & Contract Data;
   (d) The priced Schedule of Prices;
   (e) The Specifications; and
   (f) The Drawings

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 within 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
_____
(Seal)

Signature of the Employer
_____
(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

_____

(Name, Title and Address)

Witness:

_____

(Name, Title and Address)

FORM OF BANK GUARANTEE FOR ADVANCE PAYMENT

Guarantee No._____

Executed on_____

(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 Rs._____ Rupees _____) 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 the advance payment for the performance of his obligations under the said Contract.

AND WHEREAS _____ (Scheduled 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 (Scheduled Bank)

Witness:

1. _____

_____

Corporate Secretary (Seal)

2. _____

_____

(Name, Title & Address)

1. Signature _____
2. Name _____
3. Title _____

_____

Corporate Guarantor (Seal)

SECTION-IV

GENERAL CONDITIONS OF CONTRACT

SECTION-IV GENERAL CONDITIONS OF CONTRACT

This bidding document follows the FIDIC conditions of contract for construction works. The Conditions of Contract Comprise of two Sections: Section-IV – General Conditions of Contract, and Section-V – Special Conditions of Contract.

All the general Conditions shall be as per the FIDIC documents indicated below. These shall be read along with the Particular Conditions of Contract for interpretation. In case of any discrepancy between these General Conditions of Contract and the Particular Conditions of the Contract of Section-V, the provisions under the latter shall govern.

FIDIC FEDERATION INTERNATIONALE DES INGENIEURS – CONSEILS

CONDITIONS OF CONTRACT FOR WORKS OF CIVIL ENGINEERING CONSTRUCTION

FOURTH EDITION 1987

Reprinted 1988 with editorial amendments
Reprinted 1992 with editorial amendments

SECTION-V

SPECIAL CONDITIONS OF CONTRACT

TABLE OF CONTENTS

SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

(Mandatory Provisions not to be Amended / Substituted except as instructed by PEC)

1.1 Definitions

(a) (i) The Employer is: National Grid Company of Pakistan Limited (NGC) [*Formerly NTDC*]

(a) (iv) The Engineer is: **Executive Engineer, TLC Division**,
EHV-II, NGC of Pakistan,
B-2, NTPS Colony T.M Khan Road S.I.T.E Area Hyderabad
Telephone No. 92-22-9250133 Mobile No. 0335-7401970
E-mail address: xentlc.ehv2@ntdc.com.pk

or any other competent person appointed by the Employer, and notified to the Contractor, to act in replacement of the Engineer. Provided always that except in cases of professional misconduct, the outgoing Engineers is to formulate his certifications/recommendations in relation to all outstanding matters, disputes and claims relating to the execution of the Works during his tenure.

(a)(vi) The following sub-clause 1.1 (a)(vi) is added after sub-clause 1.1(a)(v):

"Bidder or Tenderer" means any person or persons, company, corporation, firm or joint venture submitting a Bid or Tender.

(b)(v) The following is added at the end of the paragraph:

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

(b)(ix) The following sub-clause 1.1(b)(ix) is added at the end of sub-clause 1.1(b)(viii):

"Programme" means the programme to be submitted by the Contractor in accordance with Sub-Clause 14.1 and any approved revisions thereto.

(e)(i) The text is deleted and substituted with 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 and remedying of any defects therein in accordance with the provisions of the Contract.

2.1 Engineer's Duties and Authority

With reference to Sub-Clause 2.1(b), the following provisions shall also apply;

The Engineer shall obtain the specific approval of the Employer before carrying out his duties in accordance with the following Clauses:

(i) Consenting to the sub-letting of any part of the Works under Sub-Clause 4.1 "Subcontracting".

(ii) Certifying additional cost determined under Sub-Clause 12.2 "Not Foreseeable Physical Obstructions or Conditions".

(iii) Any action under Clause 10 "Performance Security" and Clauses 21,23,24 & 25 "Insurance" of sorts.

(iv) Any action under Clause 40 "Suspension".

(v) Any action under Clause 44 "Extension of Time for Completion".

(vi) Any action under Clause 47 "Liquidated Damages for Delay" or Payment of Bonus for Early Completion of Works (PCC Sub-Clause 47.3).

(vii) Issuance of "Taking over Certificate" under Clause 48.

(viii) Issuing a Variation Order under Clause 51,except:

a) in an emergency* situation, as stated here below, or

(ix) Fixing rates or prices under Clause 52.

(x) Extra payment as a result of Contractor's claims under Clause 53.

(xi) Release of Retention Money to the Contractor under Sub-Clause 60.3 "Payment of Retention Money".

(xii) Issuance of "Final Payment Certificate" under Sub-Clause 60.8.

(xiii) Any change in the ratios of Contract currency proportions and payments thereof under Clause 72 "Currency and Rate of Exchange".

(Note: Employer may further vary according to need of the project)

* (If in the opinion of the Engineer an emergency occurs affecting the safety of life or of the Works or of adjoining property, the Engineer may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.)

2.3 Engineer's Authority to delegate:

The following paragraph is added:

The Chief Engineer (TL Design) shall act as representative of Employer for providing in house Engineering Services including but not limited to the following:

a) Preparation of electrical & Erection works drawings/design
b) Interpretation of the bidding documents
c) Site visits for attending any technical problem if necessary
d) Resolution of disputes
e) Review & approval of all technical matters
f) Allocation of equipment and material

The following Sub-Clauses 2.7 and 2.8 are added:

2.7 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/transportation of materials, plant and equipment for construction of the Works and their parts 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 the 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 portion of the Works.

2.8 Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 14 days before the

intended date of replacement, give notice to the Contractor, of the name, address and relevant experience of the intended replacement Engineer. The Employer shall not replace the Engineer with a person against whom the Contractor raises reasonable objection by notice to the Employer, with supporting particulars.

5.1 Language(s) and Law

(a) The Contract Documents shall be drawn up in the English language.
(b) The Contract shall be subject to the Laws of Islamic Republic of Pakistan.

5.2 Priority of Contract Documents

The documents listed at (1) to (6) of the Sub-Clause are deleted and substituted with the following:

(1) The Contract Agreement (if completed);
(2) The Letter of Acceptance;
(3) The completed Form of Bid;
(4) Special Stipulations;
(5) The Particular Conditions of Contract;
(6) The General Conditions;
(7) The priced Bill of Quantities;
(8) The completed Appendices to Bid;
(9) The Specifications
(10) The Drawings;

All Drawings and Specifications shall be interpreted in conformity with the Contract and these Conditions. Addendum, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract. If any ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction which shall be binding.

6.1 Custody and supply of Drawings & Documents

The contractor shall supply a soft copy of such drawings in source file and any other format specified by the Engineer.

The following Sub-Clauses 6.6 and 6.7 are added:

6.6 Shop Drawings

The Contractor shall submit to the Engineer for review 3 copies of all shop and erection drawings, if applicable to this Contract as per provision of relevant Sub-Clause of the Contract.

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.

6.7 As-Built Drawings

At the completion of the Works under the Contract, the Contractor shall furnish to the Engineer 6 copies and one reproducible of all drawings amended to conform to the Works as built. The price of such Drawings shall be deemed to be included in the Contract Price.

10.1 Performance Security

The text is deleted and substituted with the following:

"The Contractor shall provide Performance Security of 10% of the contract Price within Fourteen (14) days after the receipt of Letter of Acceptance. The Contractor shall provide Performance Security in the

prescribed Form annexed to these documents in the form of Guarantee from any Schedule Bank in Pakistan or from a bank located outside Pakistan duly counter guaranteed by a Scheduled bank in Pakistan.

For avoidance of doubt, Bank Guarantee issued by a foreign bank, without counter guarantee from a Schedule Bank in Pakistan shall not be considered as an acceptable Bank Guarantee. The cost of complying with requirements of this Sub-Clause shall be borne by the Contractor."

The following Sub-Clause10.4 is added:

10.4 Performance Security Binding on Variations and Changes

The Performance Security shall be binding irrespective of changes in the quantities or variations in the Works or extensions in Time for Completion of the Works which are granted or agreed upon under the provisions of the Contract.

11.1 Inspection of Site

Bidder shall inspect the site, examine and obtain all information required and satisfy himself regarding matters and things such as access to site, communication, transport, right of way, the type and number of equipment and facilities required for the satisfactory completion of work, the quantity of various sections of the work, the availability of local labour, availability and rates of materials, local working conditions, uncertainties of weather, obstructions and hindrances that may arise etc., which may affect the work or cost thereof, before submission of his bid. Ignorance of site conditions shall not be accepted by the owner as basis for any claim for compensation. The submission of a bid by the bidder will be construed as evidence that such an examination was made and any later claims/disputes in regard to rates quoted shall not be entertained or considered by the owner.

If any temporary feeder road within site is considered essential for the proper execution of the work this shall have to be formed by the Contractor at his own cost with the prior approval of the Engineer. The Contractor shall organize his own arrangement to transport his equipment, men and materials in such a manner that the completion period will not be exceeded on any account.

The rates quoted by Bidder shall be based on his own knowledge and judgement of the conditions and hazards involved and shall not be based on any representations to the Engineer.

14.1 Programme to be submitted

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receipt of Letter of Acceptance.

The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations.

Each programme shall be in the form of bar chart or a CPM chart identifying the critical activities and include:

a) The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, delivery to Site, construction, erection and testing.

b) Each of these stages for work by each nominated subcontractor

c) The sequence and timing of site inspections and tests specified in the Contract, and a supporting report which includes:

   i) A general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

ii) Details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer in accordance with this Sub-Clause.

The period between the Program updates will be 30 days. If the contractor fails to submit an updated program in time, any payment due for his current bills will be withheld till the submission of such programme.

14.3 Cash Flow Estimate to be submitted

The detailed Cash Flow Estimate shall be submitted within 21 days from the date of receipt of Letter of Acceptance

The following Sub-Clause 14.5 is added:

14.5 Monthly Progress Report

During the period of the Contract, the Contractor shall submit to the Engineer not later than the 8^{th} day of the following month, copies of Monthly Progress Reports covering:

(1) A Construction Schedule indicating the monthly progress in percentage;
(2) Description of all work carried out since the last report;
(3) Description of the work planned for the next 56 days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing;
(4) Monthly summary of daily job record;
(5) Photographs to illustrate the status of progress on the Site.
(6) Information about problems and difficulties encountered, if any, and proposals to overcome the same.
(7) Charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, delivery of material to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor.
(8) The details described in Sub-Clause 35.1 [Return of labor & Contractor's Equipment]
(9) Copies of quality assurance documents, test results and certificates of Materials.
(10) List of notices given under Sub-Clause 68.1[Notice to Contractor] and notices given under Sub-Clause 68.2[Notice to Employer & Engineer].
(11) Safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations.
(12) Comparisons of actual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

These progress reports will be submitted as per the following distribution list:

(1) PD EHV-II, Hyderabad
(2) XEN (EHV-II) NGC Hyderabad

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, deliveries of materials, quantity, location and assignment of Contractor's equipment.

14.3 Cash Flow Estimate to be Submitted

The detailed Cash Flow Estimate shall be submitted within 14 days from the date of receipt of Letter of Acceptance

15.1 Contractor's Superintendence

The Contractor's authorised representative and his other professional engineers working at Site shall register themselves with the Pakistan Engineering Council.

The Contractor's authorised representative at Site shall be authorised to exercise adequate administrative and financial powers on behalf of the Contractor so asto achieve completion of the Works as per the Contract.

The following Sub-Clauses 15.2 is added:

15.2 Language Ability of Contractor's Representative

The Contractor's authorized representative shall be fluent in the English language. Alternately an interpreter with ability of English language shall be provided by the Contractor on full time basis.

The following Sub-Clauses 16.3 and 16.4 are added:

16.3 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. If the Contractor's superintending staffs is not fluent in English language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

16.4 Employment of Local Personnel

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour from sources within Pakistan.

The following Sub-Clauses 19.3 and 19.4 are added:

19.3 Safety Precautions

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 authorise 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.

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.

19.4 Lighting Work at Night

In the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night-work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer's Representative.

20.4 Employer's Risks

Delete the text and substitute with the following:
The Employer's risks are:

a) insofar as they directly affect the execution of the Works in Pakistan:
war and hostilities (whether war be declared or not), invasion, act of foreign enemies, rebellion, revolution, insurrection, or military or usurped power, or civil war, ionizing radiations, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof, pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds, riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors and arising from the conduct of the Works;

b) loss or damage due to the use or occupation by the Employer of any Section or part of the Permanent Works, except as may be provided for in the Contract;

c) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible; and

d) any operation of the forces of nature (insofar as it occurs on the Site) which an experienced contractor:
(i) could not have reasonably foreseen, or
(ii) could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measures:
(a) prevent loss or damage to physical property from occurring by taking appropriate measures, or
(b) insure against.

21.1 Insurance of Works and Contractor's Equipment

The minimum insurance amounts and deductibles shall be:

(a) For the Works and Materials: Full value of material.
(b) For loss or damage to Equipment: Full value of the loss/damage.
(c) For loss or damage to property (except the Works, Materials, and Equipment) in connection with Contract: Full value of loss/damage to property
(d) For personal injury or death of the Contractor's employees or other people: In accordance with such applicable laws in Pakistan

21.4 Exclusions
The text is deleted and substituted with the following:

There shall be no obligation for the insurances in Sub-Clause 21.1 to include loss or damage caused by the risks listed under Sub-Clause 20.4 paras (a) (i) to (iv).

25.3 Remedy on Contractor Failure to Insure

Delete the text and substitute with the following:

The Contractor shall effect and keep in force all insurances required under the contract. The Employer shall not affect any kind of insurance on behalf of this project.

25.4 Compliance with Policy Conditions

Delete the text and substitute with the following:

"In the event that the Contractor fails to comply with conditions imposed by the insurance policies affected pursuant to the contract, the Contractor shall indemnify the employer against all losses and claims arising from such failure."

The following Sub-Clause 25.5 is added:

25.5 Insurance Company

The Contractor shall be obliged to place all insurances relating to the Contract (including, but not limited to, the insurances referred to in Clauses 21, 23 and 24) with either National Insurance Company of Pakistan or any other insurance company operating in Pakistan and acceptable to the Employer.

Costs of such insurances shall be borne by the Contractor.

The following Sub-Clause 31.3 is added:

31.3 Co-operation with other Contractors

During the execution of the Works, the Contractor shall co-operate fully with other contractors working for the Employer at and in the vicinity of the Site and also shall provide adequate precautionary facilities not to make himself a nuisance to local residents and other contractors.
The following Sub-Clauses 34.2 to 34.12 are added:

34.2 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of' wages and observe conditions of labour not less favourable 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 labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable 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.

34.3 Employment of Persons in the Service of Others

The Contractor shall not recruit his staff and labour from amongst the persons in the services of the Employer or the Engineer; except with the prior written consent of the Employer or the Engineer, as the case may be.

34.4 Housing for Labour

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 labour, 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.

34.5 Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour at all times throughout the period of the Contract. The Contractor shall further ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.

34.6 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.

34.7 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 labour.

34.8 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, staff or labour.

34.9 Arms and Ammunition

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

34.10 Festivals and Religious Customs

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

34.11 Disorderly Conduct

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

34.12 Compliance by Subcontractors

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

35.1 Returns of Labour and Contractor's Equipment

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking Over Certificate for the Works.

The following Sub-Clauses 35.2 and 35.3 are added:

35.2 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.

35.3 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, notify the Engineer immediately by the quickest available means.

The following Sub-Clause 36.6 is added:

36.6 Use of Pakistani Materials and Services

The Contractor shall , so far as may be consistent with the Contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and

services, available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard.

41.1 Commencement of Works

The text is deleted and substituted with the following:

The Contractor shall commence the Works on Site within the period named in Appendix-A to Bid. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

The following Sub-Clause 47.3 is added:

47.3 Bonus for Early Completion of Works

No bonus is admissible for the project.

48.2 Taking Over of Sections or Parts

For the purposes of para (a) of this Sub-Clause, separate Times for Completion (if required) shall be provided in the Appendix-A to Bid “Special Stipulations”.

The following Sub-Clause 49.5 is added:

51.2 Instructions for Variations

At the end of the first sentence, after the word “Engineer", the words “in writing” are added.

52.1 Valuation of Variations

In the tenth line, after the words “Engineer shall” the following is added:

Within a period not exceeding one-eighth of the completion time subject to a minimum of 56 days from the date of disagreement whichever is later.

53.4 Failure to Comply

This Sub-Clause is deleted in its entirety.

54.5 Conditions of Hire of Contractor’s Equipment

The following paragraph is added:

The Contractor shall, upon request by the Engineer at any time in relation to any item of hired Contractor’s Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.
The following Sub-Clauses59.4 & 59.5 are added:

59.4 Payments to Nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with Clause 58 [Provisional Sums], except as stated in Sub-Clause 59.5 [Certification of Payments].

59.5 Certification of Payments & Nominated Subcontractors

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor

has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

a) submits reasonable evidence to the Engineer, or
b) i) satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and
ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement,

Then the Employer may (at his sole discretion) pay direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

60.1 Monthly Statements

In the first line after the word "shall", the following is added:

"on the basis of the joint measurement of work done under Clause 56.1,"

In Para (c) the words "the Appendix to Tender" are deleted and substituted with the words "Sub-Cause 60.11 (a)(6) hereof".

(in case Clause 60.11 is applicable)

60.2 Monthly Payments

In the first line, "28" is substituted by "14".

60.3 Payment of Retention Money

a) The following text is added at the end:
"In addition to above, release of this retention money is subject to issuance of GRN/SRS by In charge of designated NTDC Warehouse for balance material of the project as per material reconciliation report along with certification from In charge of the Ware House of completeness and healthiness of the returned material. The material reconciliation report shall be duly vetted by Chief Engineer (T/L) Design as per as-built profile of the project."

60.10 Time for Payment

No interest is applicable on any delay at the part of the employer. Second Para starting from "In the event of failure" and ending on "under clause 69 otherwise" is deleted.

63.1 Default of Contractor

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

Provided further that in addition to the action taken by the Employer against the Contractor under this Clause, the Employer may also refer the case of default of the Contractor to Pakistan Engineering Council for punitive action under the Construction and Operation of Engineering Works Bye-Laws 1987, as amended from time to time.

65.2 Special Risks

The text is deleted and substituted with the following:

The Special Risks are the risks defined under Sub-Clause 20.4 sub paragraphs (a) (i) to (a) (v).

67.1 Engineer's Decision

Replace eighty fourth with sixtieth in the eighth line of Para 1 of this clause.

Replace eighty fourth with sixtieth in the third line of Para 3 of this clause.

Replace seventieth with thirtieth in the fourth and fifth line of Para 3 of this clause.

Replace 84 with 60 in the sixth line of Para 3 of this clause.

Replace seventieth with thirtieth in the fourth line of Para 4 of this clause.

67.2 Amicable Settlement

Replace fifty sixth with thirtieth in the fourth line of Para 1 of this clause.

67. 3 Arbitration

In the sixth to eight lines, the words "shall be finally settled ..... appointed under such Rules" are deleted and substituted with the following:

shall be finally settled under the provisions of the Arbitration Act, 1940 as amended or any statutory modification or re-enactment thereof for the time being in force.

The following paragraph is added:

The place of arbitration shall be Islamabad, Pakistan.

68.1 Notices to Contractor

The following paragraph is added:

For the purposes of this Sub-Clause, 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.

68.2 Notices to Employer and Engineer

For the purposes of this Sub-Clause, the respective addresses are:

a) The Employer: National Grid Company of Pakistan Limited (NGC) [*Formerly NTDC*]

b) The Engineer: **Executive Engineer, TLC Division**, EHV-II, NGC of Pakistan,
B-2, NTPS Colony T.M Khan Road S.I.T.E Area Hyderabad
Telephone No. 92-22-9250133 Mobile No. 0335-7401970
E-mail address: xentlc.ehv2@ntdc.com.pk

69.0 Default of Employer

This clause with all sub clauses is deleted in its entirety.

The following Sub-Clauses 73.1, 73.2, 74.1, 75.1, 76.1, 77.1and 78.1 are added:

70.1 Increase or Decrease of Cost

Sub-Clause 70.1 is deleted in its entirety.

The following Sub-Clauses 73.1, 73.2, 74.1, 75.1, 76.1, 77.1 and 78.1 are added:

73.1 Payment of Income Tax

The Contractor, Subcontractors and their employees shall be responsible for payment of all their income tax, super tax and other taxes on income arising out of the Contract and the rates and prices stated in the Contract shall be deemed to cover all such taxes.

73.2 Customs Duty & Taxes

Contractor will submit the invoice inclusive of Provincial Sales Tax. Provincial Sales Tax shall be charged by the contractor and payments will be subject to income tax and sales tax withholding as per Rules mentioned in Federal or Respective Provincial Laws. Copy of sales tax return will be will be provided by the contractor.

74.1 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 Appendix-O 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 63.1 to 63.4 and the payment under Sub-Clause 63.3 shall be made after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.

75.1 Termination of Contract for Employer's Convenience

The Employer shall be entitled to terminate the Contract at any time for the Employer's convenience after giving 56 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor:

(a) shall proceed as provided in Sub-Clause 65.7 hereof; and
(b) shall be paid by the Employer as provided in Sub-Clause 65.8 hereof.

76.1 Liability of Contractor

The Contractor or his Subcontractors or assigns shall follow strictly, all relevant labour laws including the Workmen's Compensation Act and the Employer shall be fully indemnified for all claims, damages etc. arising out of any dispute between the Contractor, his Subcontractors or assigns and the labour employed by them.

77.1 Joint and Several Liabilities

If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfilment of the terms of the Contract and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.

78.1 Details to be Confidential

The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the prior consent in writing of the Employer or the Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the decision of the Engineer whose award shall be final.

SECTION-VI

SPECIFICATIONS

Section 6 - Specifications (Technical Provisions & Special Provisions)

This Section contains the Specifications, the Drawings, Supplementary Information that describe the Works to be procured, Personnel Requirements and Equipment Requirements.

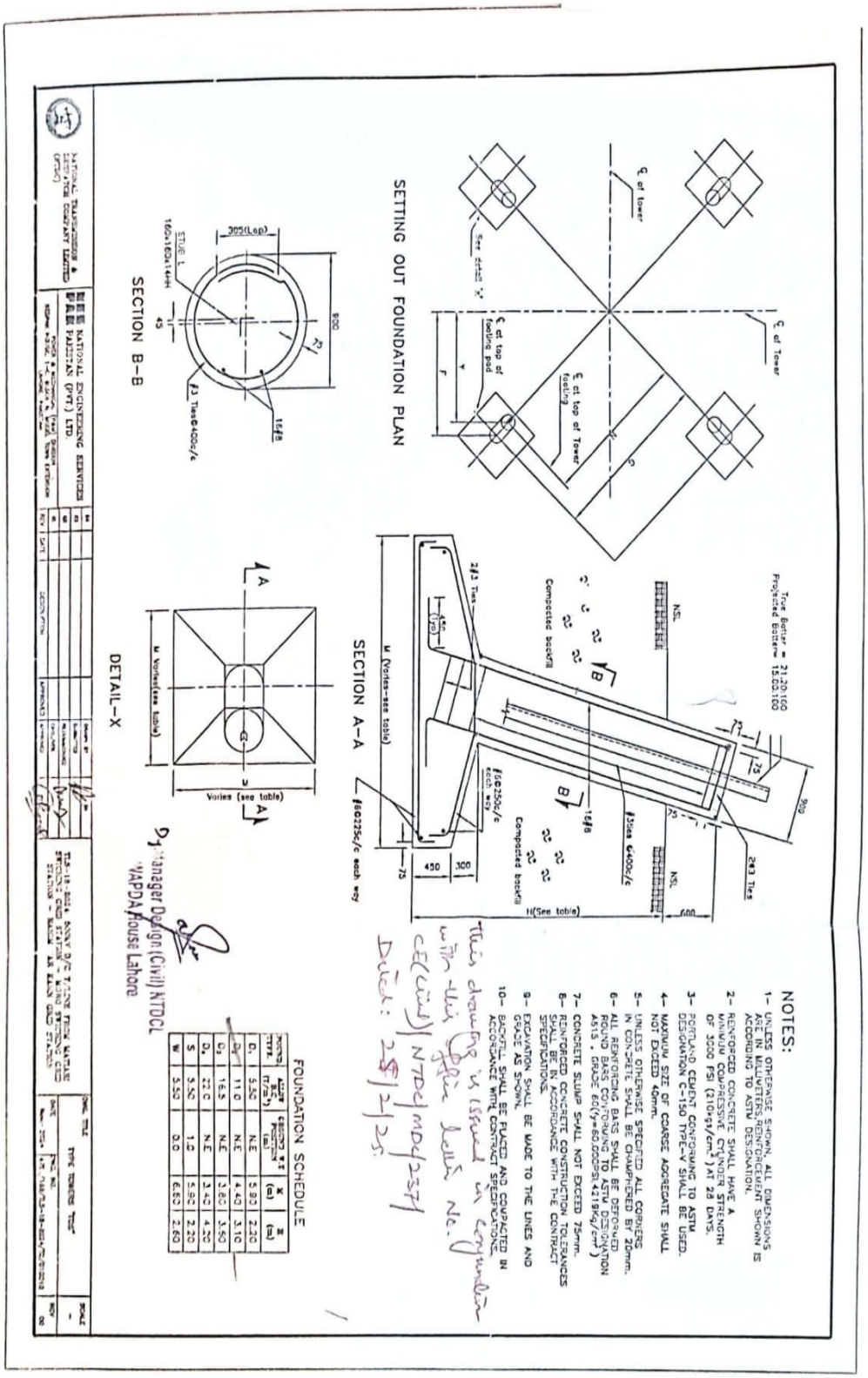
Table of Contents

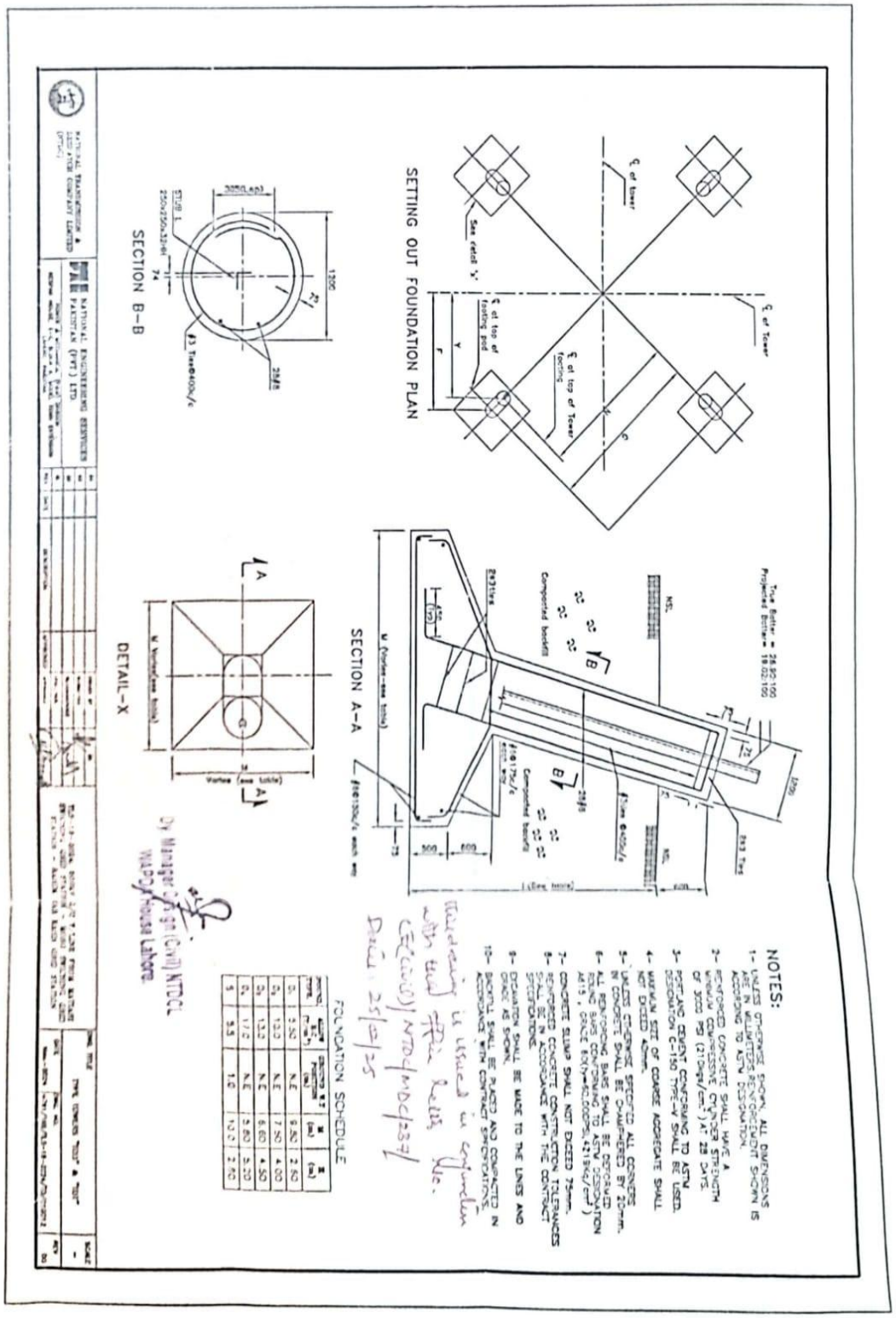
Specifications

(Please refer to Annexure-A of this document)

Drawings

(Please refer to Annexure-A of this document)


NOTES:
1- UNLESS OTHERWISE SHOWN, ALL DIMENSIONS ARE IN MILLIMETERS.REINFORCEMENT SHOWN IS ACCORDING TO ASTM DESIGNATION.
2- REINFORCED CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE CYLINDER STRENGTH OF 3000 PSI (210kg/cm²) AT 28 DAYS.
3- PORTLAND CEMENT CONFORMING TO ASTM DESIGNATION C-150 TYPE-V SHALL BE USED.
4- MAXIMUM SIZE OF COARSE AGGREGATE SHALL NOT EXCEED 40mm.
5- UNLESS OTHERWISE SPECIFIED ALL CORNERS IN CONCRETE SHALL BE CHAMFERED BY 20mm.
6- ALL REINFORCING BARS SHALL BE DEFORMED ROUND BARS CONFORMING TO ASTM DESIGNATION A615 , GRADE 60(fy=60,000PSI.4218kg/cm²)
7- CONCRETE SLUMP SHALL NOT EXCEED 75mm.
8- REINFORCED CONCRETE CONSTRUCTION TOLERANCES SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
9- EXCAVATION SHALL BE MADE TO THE LINES AND GRADE AS SHOWN.
10- BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.
SETTING OUT FOUNDATION PLAN
SECTION A-A
SECTION B-B
DETAIL-X
FOUNDATION SCHEDULE
Manager Design (Civil) NTDCL
WAPDA House Lahore
NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED
NEE NATIONAL ENGINEERING SERVICES PAE PAKISTAN (PVT.) LTD.


SETTING OUT FOUNDATION PLAN
SECTION B-B
SECTION A-A
DETAIL-X
NOTES:
FOUNDATION SCHEDULE

Supplementary Information Regarding Works To Be Procured

1 ACQUAINTANCE WITH SITE

The Contractor shall be deemed to have inspected and examined the substation 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, goods and materials necessary for the completion of the Work, the means of access to the Site and the accommodation he 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 Requirement

It is required that civil works, transportation, assembly, erection, testing and commissioning of following works in accordance with the Contract Documents and drawings:

Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro

2.1 POSSESSION OF SITE

Save, in so far as the Contract may prescribe, the extent of portions of the Site of which, the Contractor is to be given possession from time to time and the order in which such portions shall be made available to him and subject to any requirement in the Contract as to the order in which work shall be executed, NGC of Pakistan [Formerly NTDC]shall, give to the Contractor possession of so much of the Site as may be required to enable the Contractor to commence and proceed in accordance with the program referred to in Clause 35 of General Conditions of Contract and otherwise in accordance with such reasonable proposals of the Contractor as he shall, by notice in writing to the Employer, make and will, from time to time as work proceeds, give to the Contractor possession of such further portions of the Site as may be required to enable the Contractor to proceed with due dispatch in accordance- with the said programmer or proposals (as the case may be). If the Contractor suffers delay or incurs expense from failure on the part of Employer to give possession in accordance with the terms of this Clause the Employer shall grant an extension of time for the completion of the Work and certify such sum as, in his opinion, shall be fair to cover the expense incurred which sum shall be paid by NGC of Pakistan [Formerly NTDC].

2.2 LOCATION OF SITES

Site of works is located in Jamshoro, District Jamshoro. The above site is accessible by road.

3 SITE CONDITIONS

3.1 Site Conditions and Meteorological Data

(1) The Site is subject to dust/thunder and insects and vermin are prevalent. Particular care in design and packing of Goods must therefore, be taken to prevent ingress and effect of wind, dust, insects and vermin and to ensure resistance to attack by insects and vermin.

(2) NGC of Pakistan [Formerly NTDC] 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.

4 MATERIAL AND WORKMANSHIP

4.1 Material and Workmanship

(1) All materials, manufacture, testing and workmanship of material and Work, shall comply with the requirements of the Contract Documents. Material, Work or parts which are not covered by the Specifications given herein, shall comply with the applicable standards, rules, codes and regulations of the Internationally approved standardizing bodies as indicated in these Contract Documents.

(2) The intent of these Specifications is that the materials and workmanship of Work 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 Goods or parts and materials described and not be interpreted as eliminating other Goods and materials of equal performance, quality and durability.

(3) In choosing materials and their finishes due regard shall be given to the conditions prevailing at Site.

(4) All matters relating as to the acceptability or otherwise of the Goods, Work and materials offered under this Contract shall be decided by the Employer whose decision shall be final.

4.2 Extent of Specifications

The extent of the Contract Documents is to provide for the Work herein specified to be fully complete in every detail for the function designated. All Goods, materials, fittings, accessories, apparatus, labour or services which are not specifically mentioned in the Contract Documents, but which, in the opinion of the Employer, are usual or necessary for the satisfactory completion of the Work shall be deemed to be included in the Contract Documents and shall be provided by the Contractor without extra cost to NGC of Pakistan [Formerly NTDC].

5 WORK BY CONTRACTOR (SCOPE)

The scope of the work to be executed under this Contract comprises of but not limited to following:

Construction of 500 kV Double Circuit Model Transmission Line in TSG South Jamshoro

Except as otherwise specified or as constrained by the Contractor's standard design, the Works shall generally conform to equipment in layout, control functions and any other feature intrinsic to the orderly and safe operation of the substations as to which requirements the Contractor shall be responsible for satisfying himself. Prior to commencement of Works the Contractor shall visit the Site(s) to be knowledgeable of the detailed requirements.

6 DRAWINGS

6.1 Drawings in Contract

6.1.1 Specification Drawings

The specification drawings show the scope of Work to be performed by the Contractor. These are only reference drawings. Actual drawings shall be shared upon start of work.

6.1.2 Tender Drawings

The drawings provided in the tender shall not be used for execution of the Work unless the Employer gives specific instructions/ approval for such use.

6.1.3 **Construction Drawings**

The Work shall be performed in accordance with the detailed construction drawings.

The drawings provided with the bidding document are the reference drawings to be used for filling of BOQ only.

The actual construction / work drawings will be issued by the Engineer (Design office, NGC of Pakistan [Formerly NTDC]) to the successful bidder on, "if and when required" basis.

6.1.4 **Detail Drawings**

All the basic/ scope drawings, specifications, schemes and any other information shall be provided by the Employer to the successful contractor on if and when required basis in due time and in logical order to facilitate proper coordination. However, allied engineering drawings (electrical/mechanical), required for the successful completion of the project shall be responsibility of the contractor, but the contractor will be liable for the Employer's approval before the implementation of such drawings (allied drawings).

6.1.5 **Drawings, Data and Instruction Manuals**

The following working drawings shall be provided by Employer "if and when required" basis.

1. Plan tabling drawing of related T/Line as issued by concerned office.
2. The Revised Profile of existing T/Line issued by concerned office.
3. Civil drawings/ foundation design of proposed tower type issued by concerned office.

6.2 **Data Other than Drawings**

All of the applicable requirements of this Clause with reference to drawings shall be provided by the Employer and shall apply equally to catalogues, cuts, illustrations, printed specifications, or other data.

6.3 **SUBMISSION AND APPROVALS**

6.3.1 **Work Prior to Provision of Drawings by** NGC of Pakistan [Formerly NTDC]

Any work done prior to the supply of detailed work drawings by the contractor and approval of the same by Engineer/Employer, shall be at the Contractor's risk. The Employer shall have the right to request additional details and to require the Contractor to make any change in the design, which are necessary to conform to the provisions and intent of these Specifications and such changes shall be made without additional cost to NGC of Pakistan [Formerly NTDC]. The supply of drawings by the Employer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory. These drawings shall not be held to relieve the Contractor of the obligations to meet all the requirements of these Specifications or of the responsibility for the correctness of the drawings or for correct fit of assembled Goods furnished by the NGC of Pakistan [Formerly NTDC].

6.3.4 **Drawings and Revisions**

All issued drawings and data shall form a part of the Contract. If revisions are made after a drawing has been issued, the revised drawing shall be considered final and become a part of the contract.

6.3.6 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 NGC of Pakistan [Formerly NTDC] and shall be non-returnable. NGC of Pakistan [Formerly NTDC] will have the right to use this property.

7 STANDARDS AND TYPICAL DESIGN

7.1 General

The Specifications cite or imply International Standards and typical design for Work, Goods and materials. Other equivalent Standards and typical designs are equally acceptable provided that they in no way detract from the quality, safety, operability of the Work, Goods 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 the bidder sets no alternatives forth, it will be assumed that Work, Goods 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 Goods or Work 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 Bidder may propose to the Employer an equivalent standard other than that specified, in which case he shall submit the proposed standard and all other information required by the Employer 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 copy of the latest revision of the standards used in his design.

7.2 Applicable Standards and Codes

(1) All Goods, materials, Work and design shall be generally in accordance with latest revision of the standards specified in the Technical Provisions except where specifically directed otherwise. 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 Employer 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.

8. TRANSPORTATION AND PACKING

8.1 Packing

(1) The Contractor shall pack all parts of the Goods / materials for transportation 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 Goods and materials shall be packed so as to guarantee safe transportation of the Goods and materials from site to the NGC of Pakistan [Formerly NTDC] designated stores under any conditions and limitations that may be encountered. The manner of packing shall be such that it protects the Goods, 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.

8.2 **Lifting**

The method of lifting, type of equipment and type of slings, used for handling the conductor reels are subject to approval by the Engineer. The wooden reels are so constructed as to be supported either on an axle through the arbor hole or by the reel flange. When an axle supported from above lifts the reels, a spreader bar must be employed to prevent reel damage by inward pressure on reel flange. In no case shall metallic slings or other metallic equipment shall come in contact with conductor or overhead shield wire or ground wire.

8.3 **Slings**

If the use of slings is necessary, these shall be of a flexible type and preferably manila rope or other non-metallic materials. The use of steel wire, mesh or chain link slings is prohibited unless they are covered with rubber hose or some similar material.

8.4 **Cost of Transportation**

(1) The contractor shall be responsible (bear the cost) for the transportation of goods/plant/equipment from site to NGC of Pakistan [Formerly NTDC] warehouses as included in BOQ.

(2) The Contractor shall insure and transport the Goods, materials and his Equipment from site to nominated warehouse and shall be solely responsible for selection of routes and carriers, and expediting in order that all shipments are safely and expeditiously transported to the Warehouse.

(3) The Contractor 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, should 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 Goods 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.

8.5 **Unloading and Storage at the Warehouse**

(1) The Contractor shall unload all Goods and other material (except Spare Parts) at the Warehouse. Items for permanent installations shall be properly stored and shall be protected as required to prevent damage or deterioration of any type. Storage/ Stacking methods shall be such as to cause minimum inconvenience to others and shall be arranged to facilitate inspection.

(2) All Goods and other material storage shall comply with the requirements of the Specifications or to the approval of the Engineer.

(3) The Contractor shall be held responsible for all costs of damage to the steel structures (including replacement) after they are dismantled from site.

(4) Lifting of pieces, which are galvanized or painted, shall be by hand or by hemp rope on as approved by the Engineer, or by wire rope which is suitable covered with rubber or similar material lifting by steel chains is prohibited. Steel pieces shall not be dropped, thrown, or skidded over steel, concrete or rock surfaces.

(5) When steel components are stored temporarily they shall be blocked on wood & separated to prevent damage.

8.6 **Ownership of Packing Materials**

All packing boxes, reels, shipping containers except those containers, which are not the property of the Contractor, planking covers, etc, shall become the property of NGC of Pakistan [Formerly NTDC]. All the packing materials shall be handed over to NGC of Pakistan [Formerly NTDC] immediately after storage requirements of the Goods or part thereof and other materials are over.

8.7 **Receiving Reports and/ or Damage Reports**

(1) The Contractor shall prepare and submit receiving reports to NGC of Pakistan [Formerly NTDC] and the Employer 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 / NGC of Pakistan [Formerly NTDC] for any loss and damages in transit. In the event of loss and/or damage, the Contractor shall immediately report to NGC of Pakistan [Formerly NTDC]/Engineer. Prompt action shall be taken by the Contractor with intimation to Engineer/ NGC of Pakistan [Formerly NTDC], to record and remedy 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).

All scope of the works shall be performed in accordance with the WAPDA/NTDC relevant

09 **SHOP INSPECTION AND ORDERS FOR MATERIALS (NOT APPLICABLE)**

11 **SCHEDULE, PROGRESS REPORTS AND MEETINGS**

11.1 **Schedule**

The Contractor shall carry out the Work in accordance with the dates/ periods specified in Schedule provided by the contractor and approved by the Employer, which shall be provided. The Contractor shall regularly review the Schedule and notify the Employer promptly of any revisions, which in his view may be required from time to time.

11.2 **Form of Schedule**

The Schedule 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 schedule showing the logical sequence in which the Work will be carried out in sufficient detail to satisfy the Employer that the Work is thoroughly planned and meets all the requirements of the Contract Documents. In preparing the Schedule, the Contractor shall fully take into account the requirements (and possibilities) for inland transportation.

11.3 **Erection/Construction**

(1) The delivery of components and parts of the Goods/ Material should be so estimated so as to permit erection work and construction work to proceed in an orderly manner so that the required Commissioning Dates can complete the Work. The Contractor in preparing and regularly reviewing the Schedule in respect of the erection work shall comply with the requirements of Contract.

(2) The Contractor shall promptly bring to the attention of the Employer any amendment to the Schedule, which in his view may at any time be required to ensure that the Commissioning Date/ Periods will be met.

(3) Prior to steel erection, the Contractor shall examine the existing work on which this work is in any way dependent (that is , verify elevations & dimensions of foundations including anchor bolts & embedded angles) & report to the Site Engineer any errors on discrepancies that may affect the Contractor's work.

(4) Should the Contractor encounter any foundation surfaces or anchor bolts & embedded parts, which do not match the structural steel he shall immediately notify the Site Engineer. If in the opinion of the Site Engineer the discrepancy is due to misplacement of the concrete, anchor bolts or embedded parts the Contractor will be required to rectify the defect, all at his own expense & to the satisfaction of the Engineer. If in the opinion of the Engineer, the discrepancy is due to faulty fabrication of the structural steel, then the rectification of the defect shall be the responsibility of the Manufacturer(s) of the Plant.

(5) Unless otherwise specified, the Contractor shall assemble & erect the switchyard structures to the tolerance dictated by ASTM or equivalent DIN Standards.

(6) The erection tolerance on a post insulator support structure & a lightning arrestor support structure shall be such that a plumb line passing through the centre of the bolt circle on the top plate of the structure shall pass within +/- 6 mm of the location lines shown on the drawings. The anchor bolts in the structural foundation shall be located to within +/- 6 mm of the location lines shown on the drawings.

(7) The top plate of the Post Insulator support structures shall be aligned so that the center line of the plate shall be parallel to the longitudinal axis of the bus it is supporting, to a tolerance of 3 mm over the length of the plate.

(8) The top plate of the bus support structure shall be level within 3 mm

(9) All other structures shall be erected-plumb or level within plus or minus a tolerance or 1 in 1000 & according to ASTM OR EQUIVALENT DIN Standards.

(10) The structural steel shall be assembled and erected in such a manner as to ensure that members are not subjected to any damage or undue stress.

(11) Sections or portions of the structure shall be assembled and bolted on the ground so that they can readily be lifted in consecutive manner & connected together in the air to form a complete structure. Care shall be taken to prevent damage to the steel pieces or galvanizing thereof. The tools & method of assemble shall be subject to the approval of the Engineer but generally only flat non-adjustable or socket type wrenches shall be used.

(12) During assemble & erection, reaming or holes is prohibited unless the Engineer gives his approval, which shall be based solely on deviations in the fabrication of the steel. The non alignment of holes in connecting members if due to faulty erection procedures shall be corrected by the Contractor at his own expense.

(13) Driving of pins through the bolt holes for the purpose of enlarging the holes is prohibited.

(14) Structures shall be erected in accordance with the erection drawings, plumb and true in all respects. Bolts shall be of the length specified & shall ensure that members rest on the shank of bolt.

(15) The legs & principal bracings of all panels of the structure shall be erected & bolted at a lower elevation before proceeding to a higher level.

(16) Members of each panel shall be installed as erection procedure. The Engineer must approve any deviation from this procedure in writing.

(17) Punching: when instructed by the Site Engineer, bolt threads shall be punched with steel point or chisel at the surface of the tightened nut. Where lock nuts or lock washers are provided punching will not be required but the nuts shall be properly tightened.

(18) Step Bolts: These shall be installed in each tower as it is erected.

(19) Drifting / Filling: Holes shall not be enlarged by drifting / Filling

(20) Installation of Bolts: Head of bolts shall be installed at the out side face of the structure whenever possible. Lock washers shall be used with all bolts. Bolts shall not be tightened with adjustable wrenches.

(21) Nuts & bolts shall be tightened to an amount corresponding to the full effort of a man using a 300 mm ratchet wrench, or & instructed by Site Engineer.

11.4 **Progress Reports**

(1) The Contractor within 07 days from the date of the Letter of Acceptance shall submit in writing for the approval of Employer a Schedule for the erection, testing and commissioning of the Goods/Material and construction of the associated civil work.

(2) The submission to or approval by the Engineer/ NGC of Pakistan [Formerly NTDC] of such Schedule etc. shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

(3) At monthly intervals after submission of the Schedule, the Contractor shall submit to the Employer up to five (5) copies of a written detailed progress report in an approved form together with copies of the above mentioned Schedule indicating the stage reached in design, approval of drawings, ordering and procurement of materials, 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 photographs, 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 Employer shall at all reasonable times be afforded access to the Contractor and any Sub-Contractor's premises for the purpose of ascertaining progress.

11.5 **Meetings**

(1) Soon after the date of signing of Contract, the Employer will, with the approval of NGC of Pakistan [Formerly NTDC] require a conference with NGC of Pakistan [Formerly NTDC] and the Contractor at a place mutually agreed upon, to discuss scheduling of drawings, and other similar problems, which may be pertinent to the completion of the Project.

(2) At monthly intervals or from time to time during the execution of the Contract, the Employer may call meetings, either in his Offices or at the Contractor's Offices in Pakistan or NGC of Pakistan [Formerly NTDC] office as is deemed necessary for the purpose of progress monitoring and proper execution of the Contract.

(3) As required by the Engineer, responsible representatives of the Contractor shall attend such meetings.

(4) All expenses incurred by the Contractor for attending such meetings shall be borne by the Contractor and shall not be reimbursable.

12. **SITE FACILITIES AND SERVICES**

Attention is drawn to the obligations of the Contractor to make his own arrangements at his own expense for Services or facilities provided to his employees. Any cost incurred by the Contractor in respect of any of such Site facilities or services under the Contract shall be deemed to be included in the rates and prices in the Price Schedule and no separate payment, therefore, will be made to the Contractor.

12.1 **Accommodation**

(1) The Contractor shall provide and maintain at his cost residential accommodation and transportation facilities for his own use.

(2) 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 the purposes of 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.

12.2 **Site Offices**

(1) The Contractor shall carry out investigation, design and construction of theSite office required for execution of the work and submit such design in writing to the Employer and obtain his approval.

(5) The location of the site office will also be submitted to the Employer for approval prior to the construction of the same.

(6) The Contractor shall, at his expense, carry out maintenance and management of the above office.

(7) After completion of the work, the Contractor shall dismantle or leave the above office intact subject to the approval of the Engineer.

12.3 **Work yards and Storage Areas**

(1) No storage site shall be provided by NGC of Pakistan [Formerly NTDC] to store Goods, materials or 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 campus, offices and warehouses; and perform all other work necessary for completion of the Work described herein in strict conformance with these Specifications.

(2) The Contractor shall provide his own watchman service to ensure security and safety of the Goods, materials and Work prior to NGC of Pakistan [Formerly NTDC]taking over the Work.

12.4 **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 he or his official representative can be contacted by NGC of Pakistan [Formerly NTDC] and/or Employer 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 Work and the Site reinstated to its original condition, all to the approval of the Engineer.

13 **MEASUREMENTS AND PAYMENTS**

The measurement for payment and payment for the various price schedule items will be as follows:

13.1 Ninety (90%) percent of the Contract Price against Monthly Progress Payment, certified by the site Engineer, of Work completed. Retainage from monthly progress payments will be deducted until an amount equal to ten percent (10%) of the Contract Price is reached. Thereafter no further deductions will be made.

13.2 The retained five (5%) of the Contract Price upon completion of all the Work required by this Contract Document & acceptance in writing by NGC of Pakistan [Formerly NTDC]. Final payment cannot be made until the Contractor clears & finalizes all accounts of plant furnished by NGC of Pakistan [Formerly NTDC] & equipment furnished by NGC of Pakistan [Formerly NTDC].

13.3 The Site Employer will release the balance 5% to the Contractor after "Defect Liability Period" on verification.

14 EXPEDITING

The Contractor shall provide the Employer with un-priced copies of the Contractor's Purchase Orders for material or approved Subcontracted Work at the time any such orders are placed. The Contractor shall also provide the Employer with any other relevant information requested to ensure proper expediting and scheduling of the Work.

15 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 "Price Schedule".

16 COMMUNICATIONS TO THE ENGINEER

Pursuant to the definition of Engineer, the Employer has established a Project Office at Islamabad to which the Contractor shall address all communications for the approval etc., as follows:

Executive Engineer (EHV-II) NGC of Pakistan [Formerly NTDC]
B-2, NTPS Colony T.M Khan Road S.I.T.E Area Hyderabad
Telephone No. 92-22-9250133 Mobile No. 0335-7401970
E-mail address: xentlc.ehv2@ntdc.com.pk

Or

An Engineer (individual or firm) designated by the Employer.

The Employer will establish a Site Office to supervise the Site activities. The address of the Engineer's Office at Site shall be communicated to the Contractor at that stage.

17. SPECIFICATIONS - TECHNICAL PROVISIONS

17.1 General

(1) Clearing Right-of-Way

Right-of-Way clearing shall be restricted to the minimum necessary for the safe construction and operation of the line. Clearing shall generally consist of brushing out the center line, tower locations and conductor pulling sites within 25 meters on each side of the center line. Trees over 2.5 meters in height which constitute a hazard or danger to the transmission line, or whose tops are within 6 meters at 75°C final conductor sag position, shall be removed.

The clearing of desert vegetation shall be restricted to that required for placement of footings and for the assembly and erection of towers and wire pulling Site.

No clearing will be allowed in orchards or other areas of fruit bearing trees, except as specifically approved by the Engineer.

The cleared materials will be the property of the Land Owner. If any disposal of cleared material is required, it will be disposed of by burning or other methods approved by the Engineer.

(2) **Survey and Profiling**

The technical specifications cover detailed survey including route alignment, profiling, tower spotting and contouring. The scope of work inter-alia shall include the following:

Route alignment using Google Maps, Survey of Pakistan Maps and Walk over survey etc.

Detailed Survey using RTK, GPS, DGPS, Total Stations, long range scanners & Digital theodolites of reasonable accuracies.

Digitized contouring at hilly/undulated locations.

Preparation of Survey reports including estimation of Bill of Quantities, identification and explanation of route constraints, infrastructure details available enroute etc.

All the bidders shall present their proposed methodology for execution of the work as per specifications and details of the equipment and facilities including soft wares available with them.

The Contractor must note that the Employer shall not be responsible for loss or damage to properties, trees etc. due to their work during survey. The Contractor shall indemnify the Employer for any loss or damage to properties, trees etc. during the survey work

The Contractor should note that Employer will not furnish the topographical maps prepared by survey of Pakistan but will render available assistance that may be required in obtaining these by providing letters of recommendation to the concerned authorities.

The Bidders shall give along with their bid clause by clause commentary indicating their confirmation/comments/observations in respect of all clauses of this functional requirements.

The work shall be carried out by the Contractor using modern surveying techniques i.e. RTK. The bidder shall indicate in his offer, the detailed description of the procedure to be deployed. The details of the equipment & facilities including software's for image processing, computer aided tower spotting etc. available with the bidder or his associates shall also be furnished with the bid

After carrying out the detailed survey, the Contractor shall estimate complete BOQ of the transmission lines and submit the same to the Employer.

The bidders are advised that while making bid proposals and quoting prices, all technical provisions may appropriately be taken into consideration. The bidder shall complete all the schedules and annexures in the bid proposal sheets, technical data sheets specified elsewhere.

(3) **Route Alignment**

Route Alignment shall be done using Google Maps and Survey of Pakistan Maps (scale 1:50,000). After a study of these maps, alternate routes will be identified & marked within 5 km of the beeline.

Walkover survey will be carried out on the alternate routes to obtain first-hand information of various important field data required for transmission line works and observe features on the ground which may not be clearly available in the maps such as Power lines, Type of terrain and

nature of soil strata, expanding villages and towns, rich gardens and plantations, forests and high tree areas, national parks and wildlife sanctuaries, archaeological monuments, aerodromes and prohibited areas etc. Walkover survey means going on foot over the area covering the route however vehicle may also be used wherever the terrain permits and where long distances can be seen without obstacles.

Then a comparative evaluation of the alternate routes will be done, inter alia considering, route length, number and type of angle points, nature and number of major crossings, deviation in the line due to civil/military aerodromes and other industrial installations, approach to the line in general for construction, reaches through protected or reserve forests and continuous long stretches in paddy fields etc.

Based on this evaluation, the Contractor will propose the optimal route alignment and, along with it, will provide all information/data /details collected. The Contractor will arrange joint site visits with the Employer‘s representatives for field verifications. Final route alignment will be selected with mutual consensus of the Contractor and Employer.

Final digitized route alignment drawing with latest topographical and other details/features up to 5km on both sides of selected route alignment shall be submitted for the Employer‘s approval along with report containing other information/details as mentioned above (both in hard and soft copies). Changes in the route alignment, if any, during detail survey, shall be incorporated in the final digitized route alignment drawings.

(4) Requirement of Transmission Line Routing

The alignment of the transmission line shall be most economical from the point of view of construction and maintenance.

Routing of transmission line through protected /reserved forest area should be avoided. In case it is not possible to avoid the forests or areas having large trees completely, then keeping in view of the overall economy, the route should be aligned in such a way that cutting of trees is minimum.

The route should have minimum crossings of Major Rivers, Railway lines, National / State highways, overhead EHV power lines and communication lines.

The number of angle points shall be kept to a minimum.

The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered.

Marshy and low lying areas, river beds and earth slip zones shall be avoided to minimize risk to the foundations and towers.

It would be preferable to utilize level ground for the alignment.

Crossing of power lines shall be minimum. Alignment shall be kept at a specified distance from existing lines considering RoW and tower falling distances.

Crossing of communication line shall be minimized and it shall be preferably at right angle. Proximity and parallelism with telecom lines shall be eliminated to avoid danger of induction to them.

Areas subjected to flooding such as nalla shall be avoided.

Restricted areas such as civil and military airfield shall be avoided. Care shall also be taken to avoid aircraft landing approaches.

It is desirable to take the line as near the paths and roads as practicable without unduly increasing the length of the line so as to facilitate transportation of material during construction and the patrolling / maintenance of the line. Where the line cannot be routed near paths / roads economically, care shall be taken to see that easy access is possible at every 5 to 8 km. It shall be ensured that all angle / tension points are approachable to facilitate easy transportation of stringing equipment during construction and for maintenance / breakdowns.

The line shall be aligned suitably so that it can be diverted / looped in looped out to cater for possible future loads / sub stations along the route.

In general, large angles in the line are to be avoided wherever possible. The magnitude of the angle should be small as far as possible and should never be more than 60 degrees. Angle points should be selected such that shifting of the points within 100 m radius is possible at the time of construction of the

The route of the transmission line is to be so located that, as far as possible, it is protected from high winds and falling trees & branches. In hilly tracks, the line is to be routed, as far as possible, along the side of the hills or through valleys rather than over high points. However, a route of the line very close to steep slopes of hills be avoided as far as possible as there may be difficulty in obtaining lateral (side) clearance to ground for conductors. Also, there may be overhanging / loose boulders which may roll down and damage the line.

Certain areas such as quarry sites, rich plantations, gardens & nurseries which will present the Employer problems in acquisition of right of way and way leave clearance during construction and maintenance should be avoided.

The line routing should avoid large habitations, densely populated areas, forest, animal/ bird sanctuary etc., to the extent possible.

The areas requiring special foundations and those prone to flooding should be avoided.

(5) Detailed Survey

The detailed survey shall be carried out using RTK, DGPS, Total Stations, digital theodolites etc. along the approved route alignment, inter alia including the following

Digitized profiling along the selected route along with plan details using

Power Line Systems Computer Aided Design and Drafting (PLS-CADD).

Computer aided tower spotting & optimization.

(6) Route Marking

The route of the transmission line shall be recorded using DGPS of positional accuracy less than 3mtr.

The co-ordinates of all the angle points as well as other important crossings, landmarks etc. shall be recorded using DGPS for easy relocating. In addition the angle point locations shall be marked using marking stones of size 200 x

200 x 1000 mm, with approved marks including painting above the ground level.

At the starting point of the commencement of route survey the coordinates shall be recorded. The co-ordinates of the location of the survey instrument shall also be recorded. Further, the co-ordinates at prominent position at intervals of not more than 750m along the transmission line to be surveyed up to the next angle point shall also be recorded. Wherever the line alignment crosses the EHV line, railway line or main roads, the Contractor shall record co-ordinates on the points of crossing. Wherever line route alignment passes over permanent land marks such

as rock, boulders, culverts etc. suitable white paint marks with directional and NTDCL markings shall be made and co-ordinates recorded.

(7) Profiling

Detailed survey and profiling will be carried out for complete corridor, as described in clause 3.5 (h) of this specification, using modern surveying equipment such as RTK equipment, long range scanners and total stations etc. Density of survey data collection should be sufficient to ensure that proper surface imitating actual ground situation of the surveyed corridor can be generated in PLS-CADD. In any case, distance between any two points of survey data grid should not be more than 05m. For hilly/undulated terrain, this distance should be reduced appropriately to ensure that a representative surface is generated in PLS-CADD. R/L's at other undulations in the corridor and other details such as crossings, building & structure, trees & other infrastructure etc. shall also be recorded. Areas along the route, which in the view of the Contractor, are not suitable for tower spotting, shall also be marked. Recorded survey data shall be exported to MS-Excel file format and submitted along with profile for review of the Engineer.

The complete profiling details shall be digitized and the data shall be prepared & stored in the format compatible to computer-aided tower spotting software.

Route plan and longitudinal profile, commonly referred to as 'Route Profile' or simply 'Profile', will be prepared/ plotted on square paper rolls of graphed tracing paper (1mm / 5mm / 1cm). The profile is plotted to a scale of 1: 2000 horizontal and 1:200 vertical. The profile shall progress from left to right. The height of the sheet shall be taken so that the ground profile and the towers, including extensions can be fully shown. For hilly terrain, greater height of the sheet may be taken, or the sections may be plotted on separate sheets. The length of each sheet may be taken so that approximately 5 km of the line route can be plotted. A gap of 5 to 10 cm shall be kept between sections.

The profile shall show the longitudinal profiles along the center line of the transmission line route and also the cross section profile wherever appreciable difference in level exists with reference to the center line level. The angle of line deviation, duly marked left (L) or right (R) as the case may be, shall also be shown.

Plan table drawing shall show the details of all objects lying within 50 meters on both sides of the center line of the route. Objects and their distances along the route within 50 meters on both sides of the center line, nearby villages, important roads or rivers shall be marked on the drawing.

Crossing details of power lines, roads, railway lines, canals or rivers etc. shall be marked as clearly as possible. Levels of roads, canal and river embankments, maximum water / flood levels, railway top levels and heights of supports / lines being crossed, and shall be shown in the offsets part of the profile. All trees coming within the zone of the right of way and which need to be cut / trimmed shall also be indicated.

Printed/plotted output of the digitized profiling shall be submitted by the Contractor to Employer for review before taking up computer-aided tower spotting.

(8) Optimization of Tower Location/Tower Spotting.

Optimization of tower locations shall be done by the Contractor using computer-aided tower spotting software PLS-CADD and NTDC's recommended tower family. In order to verify the results of computer aided tower spotting, the Contractor shall furnish sample calculations and manual tower spotting drawings for some typical sections.

The sag-tension characteristics of the conductor as well as tower spotting data shall be furnished by the Contractor for the Employer's approval before execution. Sag template curves, shall be prepared by the Contractor on acrylic sheet indicating cold curve, hot curve, ground clearance curve and support footing curve and the same shall be submitted to the Employer.

(9) Tower Spotting

While, profiling and spotting the towers the following shall be borne in mind.

(10) Extension

An individual span shall be as near to the normal design span as possible. In case an individual span becomes too short with normal supports on account of undulations in ground profile, one or both the supports of the span may be extended by inserting standard body / leg extension.

(11) Section Length:

The number of consecutive spans between the section points shall not exceed 13 spans or 5km in plain terrain and 10 spans or 3 km in hilly terrain for double circuit 500kV line. The number of consecutive spans between the section points shall not exceed 12 spans or 4.5 km in plain terrain and 10 spans or 3 km in hilly terrain for 220kV line. The number of consecutive spans between the section points shall not exceed 14 spans or 4.5 km in plain terrain and 10 spans or 3 km in hilly terrain for 132kV line. A section point shall comprise of tension point with angle type tower.

(12) Loading

There shall not be any upward force on suspension towers under normal working conditions and the suspension towers shall support at least the minimum weight span as provided in the designs. In case uplift is unavoidable, it shall be examined if the same can be overcome by adding standard body extensions to the towers failing which tension towers designed for the purpose shall be employed at such positions.

(13) Road Crossing

The ground clearance at the roads under maximum temperature and in still air shall be such that even with conductor broken on adjacent span, ground clearance of the conductor from the road surfaces shall not be less than be less than 10.0m for 500kV and 8.0m for 220kV and 132 line. At all national highways, tension towers shall be used and crossing span shall not be more than 350 meters.

(14) Railway Crossings

All the railway crossings in the route of transmission line shall be identified by the Contractor. At the time of detailed survey, the railway crossings shall be finalized as per the regulation laid down by the Railway Authorities. Following are important considerations in this regard.

The crossings shall be supported on angle tower on either side depending on the merits of each case.

The crossing shall normally be at right angle to the railway track.

The minimum distance of the crossing tower shall be at least equal to the height of the tower plus 6m away measured from the centre of the nearest railway track.

No crossing shall be located over a booster transformer, traction switching station, traction sub-station or a track cabin location in an electrified area.

Minimum ground clearance above rail level of the lowest portion of any conductor under condition of maximum sag shall be maintained at 11.75m for 500 kV, 11.28m for 220kV line and 10.97 for 132kV line.

The crossing span shall be limited to 300/250 meters for 500kV/220kV/132kV lines.

(15) River Crossings

In case of major river crossing, towers shall be of suspension type and the anchor towers (Balancing towers) on either side of the main river crossing shall be used with zero-degree deviation. Clearance required for navigation shall be provided. For non-navigable river, clearance shall be reckoned with respect to highest flood level (HFL).

(16) Power line Crossings

Wherever the line is to cross another power line, it will be ensured that higher voltage line will pass above the lower voltage line. Minimum clearance in between lines when crossing each other will be as per NTDC standard. The angle of crossing has to be preferably 90 degrees and at any time should not be below 60 degrees.

The crossing of the new line over an existing power line is preferably done in the middle of the span between towers of existing power line where there is maximum sag of the conductor. When the line to be constructed is crossing another important EHV line for which shutdown may be difficult, suspension towers in combination with angle / dead end towers, with extensions as required, may be used.

The crossing of the new line below an existing power line shall be done at locations where adequate ground clearance for the new line and the specified clearance from the existing power line are available. Such crossing shall preferably be in the mid span between towers / structures of the new power line, where there is maximum sag of the conductor, and near one of the towers of the crossing span of the existing line for taking advantage of the higher height of the conductors. These measures reduce the requirement of increasing the height of the existing line for obtaining the requisite clearance.

(17) Details Enroute

All topographical details, permanent features, such as trees, building etc. 25m (Total-50 meter) for 500kV, 17.5m (Total- 35 meter) for 220kV line and 13.5m (Total- 27 meter) for 132kV line on either side of the alignment shall be detailed on the profile plan. All the topographical details (trees, buildings, permanent structures, including open land) shall be included in the report.

(18) Clearance from Ground, Building, Trees etc.

Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with NTDC standard as amended up to date.

The Contractor shall also intimate the Employer, his assessment about the likely amount of tree & crop compensation etc. required to be paid by the Employer during execution stage. This assessment shall be done considering prevailing practices/guidelines, local regulations and other inquiries from local authorities.

(19) Right of Way

Following right of way width shall be maintained taking into consideration the theoretical requirement of right of way and transport requirements of maintenance:

Transmission Voltage	Recommended Width of Right of Way
132 kV	27 meters
220 kV	35 meters
500 kV	50 meters

(20) Preliminary Schedule

The profile sheets showing the locations of the towers together with preliminary schedules of quantities indicating tower types, wind & weight spans, angle of deviation, crossing & other details etc. shall be submitted by the Contractor for review & approval by Employer.

(21) Detailed Survey of Tower Locations.

The detailed survey shall be conducted for spotting the tower locations on ground conforming to the approved profile and tower schedule.

The co-ordinates of all the tower locations shall also be recorded using DGPS of positional accuracy less than 3m. The position of all tower locations shall be marked in the final digitized route alignment drawing with relative distance from any permanent benchmark in the area.

The Contractor shall also collect required data at each tower location in respect of soil strata, ground water level, history of water table in adjacent areas/surface water and classify the suitable type of foundation at each location.

(22) Contouring at hilly / undulated locations

The levels up or down of each pit center with respect to center of tower location shall be recorded at intervals of 2m using RTK / total stations / DGPS / digital theodolite and digitized contour plans shall be made. Based on the digitized elevation plans, the quantities of benching & protection work vis-a.-vis possible unequal leg extensions shall be optimized using suitable computer-aided techniques/ softwares. Required tower and foundation details, cost data for comparative evaluation of benching & protection work vis-a-vis unequal leg extensions shall be provided by the Contractor to the Employer before execution stage.

The changes desired by the Employer in the preliminary tower schedule or as may be required based on detailed survey of tower locations & contouring by the Contractor, shall be carried out by the Contractor and the final tower schedule shall be submitted for approval of Employer. The tower schedule shall show position of all type of towers, span length, type of foundation for each tower, benching & revetment requirement, unequal leg extensions, deviation at all angles, crossing and other details etc.

(23) Survey Methodology & Precision

All elevations shall be referenced to benchmarks established by the survey of Pakistan. Leveling operations shall begin and end at benchmarks approved by the Employer.

During the leveling of the profile, check surveys will be effected at intervals not exceeding 50 km. With benchmarks of known elevations. The difference in elevations as surveyed by the Contractor and as declared by Survey of Pakistan for these benchmarks shall not exceed the precision required for 3rd order surveys $e \leq 24k$ where k is the distance between benchmarks in km and e is the difference between elevations in mm.

In the absence of suitable benchmarks, the leveling shall be done by two independent leveling parties working in opposite directions along the same line. The difference in elevations between the two surveys shall not exceed the precision required for 3rd order surveys as stated above.

All-important objects and features along the transmission line centerline (railways, highways, roads, canals, rivers, transmission lines, distribution lines, telephone lines etc.) shall be surveyed and located with a positional accuracy of 1:2000 between points of known horizontal position.

17.2 **Detailed Check Survey**

The indicative drawing showing the line route and substation's locations are attached in Volume 2 of Specification Drawings.

The Employer has already carried out the detailed survey of transmission line along the selected route and prepared the profile / plan tabling which shall be handed over to the Contractor after award. The Contractor shall conduct the check survey to locate tower locations on ground conforming to the approved profile and tower schedule and to ensure that ground features, angle deviations, levels, distances, clearances, crossings etc; as shown on profile correspond with actual features at site. Any variance shall be noted and marked by the contactor. The requirement of tower site leveling and revetment work, if required, shall also be marked by the Contractor on the profiles. Locations, where benching might be required, shall also be identified. Contractor shall make contour measurements along with the calculations for the volume of benching and revetment, so that a decision can be made whether to accept benching and/or use unequal leg extensions. The co-ordinates of all the tower locations shall also be recorded using GPS/DGPS of positional accuracy less than 1m for easy relocating which shall be incorporated in the final digitized route alignment/profile.

After completing the check survey, profiles shall be re-submitted to the Employer for approval along with check survey report.

The Contractor will be responsible for the correct setting of towers as shown in approved profiles. If towers after erection are found to be out of the approved alignment/position in the profile, the Contractor will dismantle and re-erect them correctly fully at his own cost and without extension of time.

The Contractor shall be responsible to carry out survey including pegging out and layout of tower locations, spotting/staking of towers and preparation of construction structure list.

The work to be done by the Contractor shall include but not limited to the following:

(1) Validation & updating of the already prepared plan & profile drawings and construction structure lists (to be provided to the contractor after award of contract) of the proposed transmission line route with the prevailing field developments. Staking (centre and reference pegs) of the tower locations which have to be concreted are included in the Contractor's scope.

(2) Latitude and longitude by hand held GPS of each angle location should be collected and submitted to the Engineer.

(3) In case of route diversion, detail survey shall be conducted and approved by the Engineer, the Contractor will carry out investigation of diversion route alongwith necessary plan tabling of the area and shall make necessary modification and establish the terminal points, the angle locations, road crossing and other points of interest as advised by the Engineer or his authorized representative.

(4) The contractor shall also be responsible to prepare plan tabling and profile drawings, tower spotting and construction structure list of any diversion route.

(5) The Contractor shall obtain necessary rules and regulations. Survey of Pakistan maps will be shown to the successful bidder in the office of the Engineer when requested.

(6) The line route will be marked on the ground with permanent concrete markers. The Contractor will install the Concrete markers of at least 130 x 150 mm at top and bottom with a height not less than 1m. The markers shall be buried 0.5 m below existing ground level. The markers shall be white washed and a red point shall be made on the top of the marker to indicate the exact center of the line. This point shall be further encircled by red paint.

17.3 **Survey Report**

Complete BoQ of the transmission lines as per the technical specifications shall be furnished in the survey report.

Each angle point locations shall be shown with detailed sketches showing existing in the close vicinity permanent land marks such as specific trees, cattle shed, homes, tube wells, temples, electric pole/tower,

telephone pole, canal, roads, railway lines etc. The relative distance of land marks from the angle points and their bearings shall be indicated in the sketch. These details shall be included in the survey report.

Information w.r.t. infrastructure details available enroute, identification and explanation of route constraints, etc. shall also be furnished in the Survey report and shall inter-alia include the following:

(1) Information regarding infrastructural facilities available along the final route alignment like access to roads, railway stations, construction material sources (like quarry points for stone, sand and availability of construction water), labor, existing transport facilities, fuel availability etc. shall be furnished in the survey report.

(2) All observations which the Contractor thinks would be useful to the construction of the transmission lines mentioned under scope of work are to be reported.

(3) Suggestions regarding the number of convenient zones (line segments/portions) in which the entire alignment can be divided keeping in view the convenience of line construction, operation, maintenance etc. are to be given.

(4) Suggestions regarding location for setting up stores during line construction in consultation with Employer representatives shall also be provided by Contractor.

(5) Working months available during various seasons along the final route alignment, with period, time of sowing & harvesting of different type of crops and the importance attached to the crops particularly in the context of way leave problems and compensation payable shall be stated by the Contractor.

(6) Availability of labor of various categories and contractors of civil works shall also be reported.

(7) Some portions of the line may require clearance from various authorities. The Contractor shall indicate the portion of the line so affected, the nature of clearance required and the name of concerned organizations such as local bodies, municipalities, Irrigation Department, Railway Authorities, Forest Authorities, Military and Defense Authorities etc.

18 Sub Soil Investigation

18.1 General Information & Scope of Work

The scope of work includes detailed soil investigation at various selected tower locations as approved/desired by the Engineer such as selected angle points, railway crossings, road crossings, power line crossings, river crossings etc. In addition, soil investigation may be required to be carried out at other locations at the discretion of the Engineer depending upon the soil strata, terrain and other factors.

These specifications cover the technical requirements for a detailed Geotechnical Investigation and submission of a detailed Geotechnical Report.

Mobilization of all necessary tools and equipment, provision of necessary engineering supervision and technical personnel, skilled and unskilled labor, etc. as required to carry out the entire field investigation as well as laboratory tests, analysis and interpretation of data collected and preparation of the Geotechnical Report.

Contractor shall also collect data regarding variation of subsoil water table along the proposed line route.

The Work specified herein is to determine the type and geotechnical characteristics of the foundation strata to the specified depth and location. This is to be accomplished through rotary drilling, field testing, ground water observations, soil sampling and laboratory testing. The location along with depth of investigation boreholes on the ground shall be established by the

Contractor in accordance with the Drawings and from reference points approved by the Engineer as per requirement.

The Geo-technical investigations and report shall conform to all International ASTM Standards, Specifications (shall be the latest editions including all applicable official amendments and revision)

The Contractor shall have at site, at all times only qualified experienced geologist/engineer who will conduct and supervise drilling/logging activities. Hand held GPS should be available at investigation site for verification of bore hole/test pit location by the Engineer.

The Contractor shall also measure soil resistivity at each borehole.

The Contractor shall propose suitable foundation design on the basis of soil investigation. If it is determined that a new foundation design, other than those being already used by NTDC, is required depending on the soil investigation results, the Contractor would design such new foundations types such as grillage foundation, undercut foundation, rock-anchor foundation, augured foundation etc.

18.2 **Method of Drilling**

Drilling shall be done by rotary including rock coring method by means of which a hole of specified diameter is extended in depths. Use of bottom discharge drilling bit shall not be permitted. The Contractor shall only be allowed to use percussion method where gravels and boulders are encountered after the approval by the Engineer.

18.3 **Drilling of boreholes in flowing water conditions**

Drilling may be carried out under water conditions. During the investigation, the Engineer may change such locations to land drilling depending upon the prevailing water way conditions.

18.4 **Test Pit**

The test pits shall be excavated at the locations as specified by the Engineer. Excavations of test pits shall be made to the depths as directed by the Engineer by manual labor and with the help of suitable digging tools. Test pits shall generally be excavated to a depth of about 3 meters below the ground surface or bed rock whichever is encountered earlier. Undisturbed black (30cm x 30cm x 30cm) sample shall also be extracted from each test pit. The dimension at the bottom of pit shall not be less than 1.5 m x 1.5 m. After field testing and sampling, the test pit should be backfilled as instructed by the Engineer.

18.5 **Drilling Fluid**

The drilling fluid used for rotary drilling shall be clean water clear from suspended sediments. The Contractor may use the natural or commercial drilling mud/bentonite slurry as drilling fluid.

18.6 **Casing of Boreholes.**

Casing of a required size allowing entry of sampling tools shall be used in conjunction with drilling to wall the boring to the bottom of the hole.

The casing shall be made of cylindrical steel pipes and shall have sufficient strength so as to maintain position and shape during drilling operations.

The casing may be omitted only where it can be shown to the satisfaction of the Engineer that sampling operations without the casing will not entrain soils from an elevation higher than the depth at which field testing or sampling is to be made.

It shall be the Contractor's responsibility to pull out casing from the bore holes after its completion for which no extra payment shall be made.

18.7 **Field Testing**

Field testing shall include Standard Penetration Test. Standard Penetration Test shall conform to ASTM D-1586. This designation describes as procedure to obtain a record of the resistance of subsoils to the penetration of a standard sampler and to obtain representative disturbed samples of the material for identification purposes and laboratory testing. The penetration resistance shall be expressed as the number of blows of a 63.4 kg (140 lbs) hammer freely dropping 762 mm (30 inches) required to force the standard sampler 305 mm (12 inches) into the soil. Standard Penetration Tests shall be conducted in the bore holes at one-meter interval from 1-meter depth to 10/15-meter depth of bore hole and up to 40 m in case of river crossing locations, unless otherwise directed by the Engineer. Immediately after each penetration test a representative portion of the soil core shall be placed in moisture proof container.

18.8 **Undisturbed Sampling**

The undisturbed samples shall be taken in cohesive and non-cohesive materials. Samples shall be obtained using Denison or Pitcher sampler or equivalent double tube core barrel or Shelby tube. The sampling procedure shall conform to latest B.S./ASTM Standards. The length of undisturbed samples obtained shall not be less than 30 cm. immediately upon extraction from the hole, the sample shall be properly waxed. The number and depth of undisturbed samples from each hole shall be as directed by the Engineer during the progress of the drilling work at site.

18.9 **Labeling and Disposition of Samples**

Each sample shall have identification tags giving information regarding Sample No., Top Elevation of Hole/Test Pit, Date of Sampling, Depth and Length of Sample, and Description of Sample. The selected undisturbed and disturbed samples shall be carefully transported for testing by the Contractor to the approved testing laboratory. Every precaution shall be taken to avoid damage to samples as a result of careless handling and undue delay in transportation. The tubes containing undisturbed samples and cores shall be well packed in wooden boxes to protect the samples against vibration.

18.10 **Ground Water Observations**

Whenever required by the Engineer, bore holes shall be preserved for observations of ground water conditions. When the borings are advanced by using natural or commercial drilling mud/bentonite to stabilize the hole, the hole shall be flushed thoroughly with clean water at the completion of boring for the purpose of observing ground water levels.

18.11 **Laboratory Tests**

(i) **General**

Laboratory tests shall be scheduled and performed by qualified and experienced personnel who are thoroughly conversant with the work.

The laboratories in which the samples are to be tested shall be approved by the Engineer.

Laboratory tests shall be conducted using approved apparatus complying with the requirements and specification of International Standards for this type of work. It shall be checked that the apparatus are in good working condition before starting the laboratory tests. Calibration of all the instruments and their accessories shall be done carefully and precisely at an approved laboratory.

One copy of all laboratory test data records shall be submitted to the Employer progressively every week. Laboratory tests shall be carried out concurrently with the field investigations as initial laboratory test results could be useful in planning the later stages of field work.

A schedule of laboratory tests shall be established by Contractor to the satisfaction of the owner within one week of completion of the first bore hole.

- The person representing to the Engineer shall have access to the laboratories to supervise and check the laboratory testing of the samples.

- The testing shall be carried out in accordance with ASTM or equivalent British Standards, or as directed by the Engineer.

(ii) **Tests**

The Contractor shall arrange to carry out laboratory tests on the specified samples of the subsoil material/water sample. The samples to be tested and the tests to be carried out for each sample shall be specified by the Engineer.

Undisturbed soil samples retained in liners or seamless tube samplers shall be removed, without causing any disturbance to the samples, using suitably designed extruders just prior to actual testing

Laboratory testing may include but not limited to the tests listed below:

a) Grain Size Analysis (Sieve + Hydrometer)
b) Soil Classification with percentage of gravel, sand, silt and clay at different depths.
c) Safe Soil Bearing Capacity (particularly at 5m depth)
d) Atterberg's Limits
e) Chloride Content (soil and water)
f) Bulk Density and Moisture Content
g) Dry Density
h) Generalized Subsurface Geotechnical Models with tables showing soil characteristics for each tower location
i) Capacity Curves at 4, 5, 6, 7m depths and Allowable Load vs Foundation Width for different Models.
j) Organic Matter Content
k) Sulphate Content (soil and water)
l) PH value (soil and water)
m) Unconfined Compression Test
n) Direct Shear Test
o) Consolidation Test
p) Total Soluble Salts.

18.12 **Confirmatory Sub-Soil Investigation**

After preliminary subsoil investigations confirmatory investigation (if required) up to maximum depths of 30 meters will be carried out by the Contractor. The location of selected confirmatory investigation will be conveyed to the Contractor by the Engineer.

18.13 **Record**

The Contractor shall have at site, at all times only qualified, experienced, orderly and thoroughly competent graduate Geologist who shall conduct and supervise drilling operations sampling and logging.

Contractor shall submit a formal report containing geological information of the region, procedures adopted for geotechnical investigation, field observations, summarized test data, conclusions and recommendations. The report shall also include detailed bore logs, subsoil sections, field test results, laboratory observations and test result both in tabular as well as graphical form, practical and theoretical considerations for the interpretation of test results, supporting calculations for the conclusions drawn etc.

The Contractor shall keep accurate logs and records of all the Work accomplished under this Contract. All such records shall be preserved in good condition by the Contractor until they are delivered and accepted by the Engineer. The Engineer shall have the right to examine such records at any time prior to their delivery to him. The following information shall be included in the records for each investigation borehole:

Bore hole/test pit number or designation, coordinates and elevation of top of the bore hole/test pit;

Type of drilling operations;

Dates and time by depths when drilling operations were performed;

Depths at which samples were recovered and field-testing was performed including complete data of field-testing;

Depth of Ground water table from NSL; and

Description of subsoil conditions.

The presence of the Engineer Representative or keeping of separate records by him shall not relieve the Contractor of the responsibility for the Work specified in this clause. Payment will not be made if the Contractor has not furnished the records.

18.14 **Foundation design/designation**

Contractor shall submit the foundation design/designation for each tower location duly considering soil type and tower spotting data along with the data/calculations to establish that the proposed foundation type is optimized and cost effective for the review and approval of the Engineer:

The recommendations shall provide all design parameters and considerations required for proper selection, dimensioning and future performance of tower foundation and the following:

Necessary soil design parameters to verify the bearing capacity based on geological data (bore log) and laboratory test results i.e. from (a) standard penetration test & (b) analytical method.

Immediate and consolidation settlements of soil.

Seasonal fluctuation of ground water.

Cement type to be used for foundation construction (based on ACI-318 Table 4.3.1).

The Contractor shall propose suitable foundation design on the basis of soil investigation. If it is determined that a new foundation design, other than those being already used by NTDC, is required depending on the soil investigation results, the Contractor would design such new foundations types such as grillage foundation, undercut foundation, rock-anchor foundation, augured foundation etc. The Contractor shall be responsible for satisfactory performance of new foundation after erection and commissioning of towers on these foundations. Price of Design of new foundation would be quoted on “per type of foundation” basis.

Contractor shall submit the foundation design/designation along with the following data/calculations to establish that the proposed foundation type is optimized and cost effective for the review and approval of the Engineer:

Necessary soil design parameters to verify the bearing capacity based on geological data (bore log) and laboratory test results i.e. from (a) standard penetration test & (b) analytical method.
Immediate and consolidation settlements of soil.
Seasonal fluctuation of ground water.
Cement type to be used for foundation construction (based on ACI-318 Table 4.3.1).

19 Foundation Requirements

(1) General

The items in the Price Schedules for constructing the various types of concrete foundations (including pile foundations) for steel towers include the following:

(a) Tower staking;

(b) Performing all clearing, grading, cutting, blasting and leveling as required to construct the footings and erect the steel towers at the specified tower locations;

(c) Performing all required excavation, blasting (in all types of soil/rock), dewatering, shuttering, curing and compacting backfill for the concrete footings;

(d) Installing steel stub angles in the concrete footings;

(e) Tower grounding before placement of concrete;

(f) All concrete work for the concrete footings, including the cost of furnishing all reinforcing bars, and all materials for concrete;

(g) Installing pile foundations (pile, pile cap & tie beam) where required, including the cost of furnishing all reinforcing bars and all materials for concrete; and

(h) The foundation drawings included in Bidding Document are firm & final and only be changed (if required) as directed by Engineer.

(2) Excavation for Tower Footings

The Contractor shall perform all excavation required for constructing various types of concrete foundations for the steel towers. During excavation of towers sites near to amenities, the Contractor shall ensure to perform the work in such a manner as to minimum damage to them and if any prior approval is required that must be obtained at his own. However, in case of any damage the Contractor shall be get repair of it at his own risk and cost under intimation to the concerned agency.

The tower sites shall be leveled, graded/cut and cleared of trees, brush and stumps as may be required to construct the tower footings and to erect the steel towers. Cleared materials shall be disposed off, as directed by the Engineer or his nominated person.

All excavations shall be sufficient to provide concrete footings with dimensions not less than shown on the drawings.

After the Contractor has excavated the footing to the required depth, the Engineer will inspect the bottom of the excavation and determine if the bearing material is suitable for the type of footing designated for that location. If it is found that the bearing material is unsatisfactory for the type of footing designated, the Engineer or his nominated person will either designate another type of footing or ask for compacted crushed stone mixed with sand 50:50 ratio to be

placed underneath the footing for a depth of up to 1.2 meters. The Contractor will be paid only for the type of footing actually installed. However, no payment will be made to the excavation & replaced material underneath the footing.

A maximum variation of 60 mm above or below established grade will be permitted. However, if excavations are below specified grade plus tolerance, those shall be backfilled to required grade by the Contractor with the Contractor's furnished concrete at his own cost.

All excavated material which is suitable for backfilling shall be laid aside to be used for backfilling at the tower site from which it was excavated, and the excess material shall be spread evenly around the site as directed by the Engineer or his nominated person.

Concrete shall be placed as soon as practicable after each excavation is completed and all excavations shall be protected so as to maintain a clean sub-grade until the footing is placed, using dewatering, timbering, shoring, or casing, as necessary. Any sand, mud, silt, or other objectionable material which may accumulate in the excavation shall be removed at the expense of the Contractor before placing concrete. After completion of foundations all the dewatering holes shall be filled with dry sand.

(3) **Rock Excavation**

Rocks shall be excavated to the depth required to provide suitable base for the foundations as indicated on relevant drawings.

Rock excavation includes drilling, blasting, removal, drainage and pumping as required. Drilling and blasting techniques shall keep over break to a minimum and no extra compensation shall be paid for the removal of over broken material. The contact surface of the rock shall be cleared of all loose rock and soil.

The cost of any damage whatsoever caused by blasting shall be payable by the Contractor. He shall not be relieved of these costs in spite of having received approval of his methods from the Engineer.

(4) **Erosion/Slope Protection**

For erosion protection against water current, gravel blankets shall be placed such that they do not flow away with water current. These gravel blankets shall be placed at or adjacent to tower sites in the manner as directed by the Engineer or his nominated person. Gravel for the blankets shall be furnished by the Contractor, and it shall be pit-run, free draining, containing no stones larger than 635 mm size obtained from the closest source approved by the Engineer or his nominated person. The gravel shall be reasonably clean and free from vegetation, pieces of timber, or other foreign matter, and shall be distributed and graded evenly over the required areas. No compaction will be required.

Slope protection will be provided for foundations, which are located/placed on uneven ground, and/or they are partially or fully exposed in such a way that designed burden cannot be provided on these foundations safely. Slope protection shall include but not limited to construction of retaining walls of stone or brick masonry to a height and depth so as to provide adequate protection and necessary burden by making a leveled platform with or without brick/stone mortar after filling with earth as per specifications/drawings or as directed by the Engineer. The slope protection drawings will be prepared by the Contractor and submitted to the Engineer for review/approval prior to execution of Project.

(5) **Concrete Foundations**

Each tower foundation will have four footings and each footing will consist of a steel stub angle embedded in reinforced concrete. The footings for each tower in a tangent section of the line shall be placed so that the longitudinal axis of the tower cross-arm will lie in a plane perpendicular to the traverses of the line. Unless otherwise directed by the Engineer, the footings

for each angle tower shall be placed so that the tower cross-arm will lie in a plane bisecting the interior angle formed by the inter-section of the traverses of adjacent sections of the line.

The footings at the various tower sites shall be constructed in accordance with the criteria shown on Drawings.

Pile foundations will be required where the field and laboratory tests confirm the requirements. The pile foundations will be installed as shown on the relevant drawings and in accordance with these Specifications.

Any type of spread footing foundation may be changed to another type of spread footing foundation or pile foundation in accordance with field requirements during execution of the project with the prior approval of the Engineer.

(6) **Placing of Stub Angles in Footings**

Stub angles shall be placed in the tower footings as shown on the drawings and shall be supported in the proper position by means of a rigid frame or equivalent suitable device to ensure placement of the stubs within the tolerances specified below. The stub angles shall be held rigidly in a manner to prevent displacement during placing of concrete.

All stub angles for the tower legs shall be set accurately to the grade and alignment designated on the drawings and as directed by the Engineer. Work that is not within the tolerance will be corrected as directed by the Engineer, and at the Contractor's expense. The setting tolerances following complete foundation installation including backfilling and compacting are as follows:

(a) Tower Center from theoretical location:

(i) Transverse ..... ± 150 mm
(ii) Longitudinal ..... ± 500 mm

(b) Tower Orientation (angular departure from the theoretical location measured at the point of intersection of a tower face and the longitudinal center-line).....25 mm

(c) Difference in Elevation between working point marks on Stub Angles including diagonally opposite legs ..... 8 mm

(d) Departure from theoretical Horizontal Dimensions between tower center line and working point marks on stub angle:

(i) Along the tower face,
plus minus ..... 5 mm

(ii) Along the tower diagonal,
plus minus ..... 7 mm

(e) Batter …..... 5 mm
per meter

(f) Twist (about heel of stub angle) ..... 2°

(7) **Tower Grounding**

Each tower shall be grounded by installing one ground rod below each of two diagonal footings. Ground rods shall be driven at least 2.5 meters into undisturbed soil at the bottom of the footing excavation, as shown on the Drawings. The ground rod shall be connected to the stub angle by a 7 No. 10 stranded annealed copper covered ground wire. The connection of this wire to the

ground rod and to the stub angle shall be made by a bolted clamp in accordance with the Drawings.

Where it is not possible to drive a ground rod an alternative grounding by installing 'crowfoot' shall be adopted.

The resistance of the two rods/crowfoot in parallel shall be measured and recorded before concrete footings are poured. If the resistance is more than 10 ohms, additional rods/crowfoot shall be installed as directed by the Engineer or his nominated person. No extra payment would be allowed for excavation/blasting/laying/back-filling on account of this.

The dead end terminal tower of the overhead lines must be connected to the earthing system of the grid stations.

(8) **Concrete**

(a) **General**

All concrete and reinforcement placed for tower footings shall conform to the requirements of this section.

At least 30 days prior to beginning concrete placement, the Contractor shall submit to the Engineer for approval, a design mix (along with quantity and source of each material) along with six (6) test cylinders using the actual materials to be incorporated into the Work. Approval of the design mix will in no way relieve the Contractor from meeting all the requirements of these Specifications. Whenever the Contractor proposes to use a different material source, a new design mix must be submitted and approved as outlined above. During construction if in the Engineer’s opinion the mix shall be adjusted, the Contractor shall submit a new design mix as directed by the Engineer.

(b) **Materials**

The Contractor shall furnish all materials for use in concrete, including but not limited to cement, sand, coarse aggregate, water, reinforcing bars, admixture, (including ground slag) and concrete curing compound. Air-entraining agent and curing compound shall be accepted on manufacturer's certification of compliance with specification requirements. However, the Engineer reserves the right to require submission of and to perform tests on samples of the agent and/or compound prior to shipment and use in the Work at the cost of Contractor.

(i) **Cement**

Cement shall meet the requirements of ASTM C150. The cement shall be free from lumps and properly packed in bags when used in concrete. Adequate provisions shall be made by the Contractor to prevent absorption of moisture when cement is stored. Cement Type-V (sulfate resistant cement) will be used. Volume of one bag of cement should be taken as 1.25 cubic-ft.

(ii) **Sand and Coarse Aggregate**

Sand and coarse aggregate shall be furnished from any approved source. The sand particles shall be clean, hard, dense, durable, uncoated rock fragments that will pass a screen having 6.5 mm square openings. The sand shall be well graded from fine to coarse and shall be free from injurious amounts of dirt, organic matter, and other deleterious substances.

The coarse aggregate shall consist of clean, hard, dense, durable, uncoated rock fragments, shall be free from injurious amounts of flat and elongated

pieces, organic matter, or other deleterious substances. The maximum size of crushed coarse aggregate for piles shall be 19 mm and for spread footings, pile cap and tie beam 38 mm or as directed by the Engineer. The grading of these sizes shall conform to ASTM C33.

The Contractor shall submit, for testing and approval, representative samples of the sand and coarse aggregate proposed for use in the concrete work. All testing will be conducted at CMTL, Lahore or UET Jamshoro. All aggregates shall conform to the requirements of ASTM C33 including petrographic test. During construction the Contractor shall also arrange testing of sand and coarse aggregate if directed by the Engineer to determine compliance with Specifications. The cost of all laboratory testing of these samples shall be borne by the Contractor.

(iii) **Water**

Water used for mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement and shall meet the requirements shown in Table-1 below. A complete chemical analysis of water shall be submitted prior to the start of construction work and shall be required for each new water source being chosen. The cost of all laboratory tests of the samples shall be borne by the Contractor. No change in water source shall be permitted without prior approval by the Engineer.

TABLE-1

Total Dissolved Solids (TDS)	800 ppm (max)
Magnesium, Chlorides and Sulfates	250 ppm (max)
pH Value	6.5 – 8.0

(iv) **Reinforcing Bars**

Reinforcing bars shall be deformed bars conforming to ASTM Designation A615, Grade 60. Representative steel bar samples shall be collected from the site and tested in the laboratory approved by the Engineer. The testing shall be witnessed by the Engineer. The cost of all laboratory tests and traveling of Engineer shall be arranged/borne by the Contractor.

Negative variation in weight [mass] maximum up to 2% of reinforcement bar(s) from the applicable weight [mass] per unit length prescribed in Table 1 of ASTM A615 will be allowed for bar(s) placement. Contractor will have to make adjustments in bar spacing/number of bars to accommodate the excessive negative variation in weight [mass] if greater than 2%. Contractor will not be allowed for bar(s) adjustment in case of overweight [excessive mass] of any deformed bar.

(v) **Curing Compound**

Curing compound shall be wax-base and white-pigmented (Type 2) and conforming to ASTM Designation C-309 to reflect solar radiation.

(vi) **Admixtures and Ground Slag**

Admixtures to be used in concrete shall be subject to prior approval of the Engineer and shall meet the following requirements:

(1) Chemical Admixtures

Air-entraining admixtures shall conform to ASTM C 260,"Specification for Air-Entraining Admixtures for Concrete.

Water reducing or water reducing and retarding admixtures (Normal Plasticizers) shall conform to ASTM C 494, “Specification for Chemical Admixtures for Concrete”, Type A or D, respectively.

Super plasticizers shall conform to ASTM C 494, Type F or G, respectively

Only one of the Admixtures A, D, F or G, shall be added at a time.

Chloride-bearing admixtures shall not be permitted.

Super Plasticizers shall be checked for their compatibility with pozzolanic materials in blended cement concrete.

(2) **Ground Granulated Blast-Furnace Slag**

In area where high sulphate and chloride contents are present in soil/water, finely ground granulated blast-furnace slag can be used as cementatious material in concrete by replacing SRC cement by maximum up to 30%. The properties of ground granulated blast-furnace slag should meet ASTM C 989. The cost of all laboratory testing of these samples shall be borne by the Contractor. Contractor will not be paid extra for the purchase/procurement of ground granulated blast-furnace slag to the construction sites.

(c) **Composition**

The Contractor shall determine the proportions of the sand, coarse aggregate, and cement needed to provide concrete, meeting the requirements of these Specifications, and shall be approved by the Engineer. Concrete which contains 38 mm maximum-size aggregate shall have a cement content of not less than 380 kg per cubic meter and concrete which contains 19 mm maximum size aggregate shall have a cement content of not less than 440 kg per cubic meter. 38 mm maximum size aggregate shall be used for spread footing, pile caps, tie beams and 19 mm aggregate for piles. The net water cement ratio by weight shall not exceed 0.5. Surface water contained in the aggregate shall be included as part of the mixing water in determining the water content. Reinforced concrete design will be checked in accordance with the ACI Building Code.

The Contractor will take minimum three test cylinders (152mm x 305mm) per leg, and the average compressive strength at 28 days shall exceed 210 kg/cm² (3000 psi) and no individual test value should fall more than 35 kg/cm² (500 psi) from the minimum specified value.

The compressive strength of the concrete will be determined by the Engineer through the medium of test of (152 x 305 mm) cylinders made and tested in accordance with ASTM C39. The Contractor shall furnish all necessary sampling equipment such as slump cones, test cylinders, etc. at the site. This equipment is to be approved by the Engineer or nominated person by Engineer. The cost of the material lab tests shall be borne by the Contractor.

In the event that the concrete cylinder fails to meet the specified strength requirements then in-place testing of concrete shall be conducted under the supervision of the Engineer. In-place as approved by Engineer testing of concrete shall be conducted by one or a combination of the following methods:

ASTM C42 “Test Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.”

ASTM C805 “Test Method of Rebound Number of Hardened Concrete.”

The use of calcium chloride in concrete will not be permitted.

The slump of the concrete shall not exceed 75 mm for conventional foundation, pile cap & tie beam and 150-180 mm for piles.

(d) **Batching and Mixing**

Unless specifically approved by the Engineer, all concrete used on the Project shall be machine mixed. Hand mixing shall only be used when authorized by the Engineer and shall be performed under his directions.

The sand and coarse aggregate shall be weighed and shall be proportioned on the basis of integral bags of cement unless the cement is weighed. After weighing, the materials may be proportioned on the basis of equivalent volumes. The Contractor shall provide equipment and shall maintain and operate the equipment as required to accurately determine and control the amount of each separate ingredient entering the concrete. Batching shall be such that combined inaccuracies in feeding and measuring the materials will not exceed 1.5 percent for water and weighed cement and 2 percent for sand and each size of coarse aggregate. The concrete shall be uniform in composition and consistency throughout the mixed batch, and from batch to batch, except where changes in composition or consistency are directed. The mixing time shall be at least 1.5 minutes for stationary mixers. Excessive over-mixing requiring the addition of water to preserve the required consistency will not be permitted. The temperature of the concrete when it is being placed shall be not more than 35°C and not less than 5°C in moderate weather or 10°C when the mean daily temperature drops below 5°C. Truck mixers will be permitted only when the mixers and their operation are such that the concrete throughout the mixed batch and from batch to batch is uniform with respect to consistency and grading. Any concrete retained in truck mixers so long as to require additional water to permit satisfactory placing shall be wasted.

(e) **Forms Preparation for Placing of Concrete**

Unless otherwise provided for on the Drawings or approved by the Engineer, all concrete placed will be monolithic.

Forms shall be sufficiently tight to prevent loss of mortar from the concrete and shall be maintained rigidly in position until the concrete has hardened sufficiently to prevent damage by form removal. All surfaces of foundations upon or against which concrete is to be placed shall be free from standing water, mud and debris. The surfaces of absorptive foundations against which concrete are to be placed shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete. The surfaces of construction joints shall be clean, rough and surface dry when covered with fresh concrete. Cleaning shall consist of the removal of all laitance, loose or defective concrete, coatings, sand, curing compound if used, and other foreign material. A mortar layer shall not be used on concrete construction joints.

The methods and equipment used for transporting concrete, and the time that elapses during transportation shall be such as will not cause appreciable segregation of coarse aggregate or slump loss in excess of 25 mm in the concrete as it is delivered into the Work. Concrete may be transported from the mixer to the forms and deposited in the forms by any method approved by the Engineer such as transit mixers, buckets, chutes and pumping. Aluminum pipe or chutes shall not be used for tremie trunk line, or chute for placing of concrete, or for the delivery of pumped concrete. Re-tempering of concrete will not be permitted. Any concrete which has become so stiff that proper

placing cannot be assured shall be wasted. Formed concrete shall be placed in continuous approximately horizontal layers, the depths of which generally shall not exceed 500 mm. Concrete shall be vibrated (internal vibrators having a minimum frequency of 8,000 vibrations per minute) until it has been consolidated to the maximum practicable density, is free from rock pockets of coarse aggregate, and closes snugly against all surfaces of forms and embedded materials. Standby vibrators shall be available during concrete placement.

Exposed unformed surfaces of concrete shall be brought to uniform surfaces and worked with suitable tools to a reasonably smooth wood float or steel-trowel finish as directed. Concrete in the tops of foundations in which stub angles are embedded shall be sloped to provide drainage away from the stub angles.

(f) **Reinforcement**

Steel reinforcing bars shall be placed in the concrete where shown on the drawings. Before reinforcement is placed, the surfaces shall be cleaned of heavy flaky rust, loose mill scale, dirt, grease, or other foreign substances. Reinforcement shall be accurately placed and secured in position so that it will not be displaced during placing of concrete.

The Engineer shall not furnish supplemental bar-placing diagrams, bar lists, and bar-bending diagrams. Any such additional diagrams and bar lists of this type which the Contractor may require to facilitate the fabrication and placement of reinforcement shall be provided by the Contractor.

Reinforcement will be inspected for compliance with requirements as to size, shape, length, splicing, position, and amount after it has been placed.

Any bar-placing diagrams, bar lists, and bar-bending diagrams prepared by the Contractor shall conform to the requirements shown on the reinforcement design drawings and shall be approved by the Engineer. Maximum two numbers of bars (2+2) in pad and chimney can be lapped.

Lap splices shall be as under:

Bar #	3	4	5	6	7	8	9	10	11
Lap Length (mm)	305	360	460	610	840	1100	1400	1800	2160

(g) **Protection and Curing**

The Contractor shall protect all concrete against injury until final acceptance. The concrete shall be cured with two applications (coats) at right angles to each other to ensure uniform and more complete coverage with approved membrane type curing compound to be applied preferably by power sprayer as soon as possible after concrete placement and in no case later than 2 hours. Curing with water shall be used only as an alternative to the type curing and with Engineer approval. The application of the curing compound shall be in accordance with the procedures outlined by the Manufacturer. In case of pile-cap & tie beam with form, ties are loosened and vertical forms are still in place water should be applied to run down on the inside of the form to keep the concrete wet. Immediately after form removal, the surfaces should be kept continuously wet by water spray or water-saturated fabric until the membrane-forming curing compound is applied.

In exceptional cases where extremely corrosive soil conditions are encountered, or as directed by the Engineer, the surfaces of the concrete, both exposed and unexposed, shall be treated with an approved type of bituminous compound. A minimum of two applications shall be required, and the applications shall be 100 percent effective. Surfaces to be treated shall not be coated with curing compound. No extra payment will be made to the Contractor for procurement/treating concrete surfaces with bituminous compound.

(h) **Repair of Concrete**

Any concrete that is damaged or defective from any cause; concrete that is honey-combed, fractured, or otherwise defective, and concrete damaged because of excessive surface depressions, must be excavated and built up to bring the surfaces to the prescribed lines, shall be removed and replaced and any imperfections and irregularities on concrete surfaces shall be corrected. The removal and replacement of damaged or defective concrete, and the correction of surface imperfections and irregularities shall be made with concrete dry pack, or mortar (Portland cement mortar), or at the option of the Contractor, with epoxy-bonded concrete, or epoxy-bonded epoxy mortar, where and as applicable for the type of repair involved. All repairs should be completed within 24 hours after removal of forms, and as directed by the Engineer or his nominated person. However, forms shall not be removed for a period of at least 24 hours after the concrete work until it has acquired sufficient strength to safely carry its own weight and any construction loads that may be imposed on it.

(i) **Tolerances for Concrete Construction**

The Contractor shall be responsible for setting and maintaining concrete forms within the tolerance limits necessary to insure that the completed Work will be within the tolerances specified or within good construction practices. Concrete work that exceeds the tolerance limits specified herein shall be inspected by the Engineer and he will determine what effect the deviations will have upon the structural action or operational function of the structure, and what remedies may be necessary. If after such inspection the Contractor is directed to remove or replace any defective Work, he will do so at his own expense.

(aa) Tolerances for footings:

-	Variation from plumb or specified batter for lines and surfaces of stems	In any length of 3.0 meters ..... 13 mm Maximum for entire length ..... 26 mm
-	Variation in cross-sectional dimensions of stems	Minus..... 7 mm Plus ..... 26 mm
-	Variation from specified elevation for top of concrete	Minus ..... 13 mm Plus ..... 13 mm
-	Variation of dimensions in plan	Minus ..... 13 mm Plus ..... 52 mm
-	Misplacement or Eccentricity	2 percent of the footing width in the direction of misplacement but not more than 52 mm

	Reduction in thickness	5 percent of specified thickness

(bb) Tolerance for placing reinforcing steel:

-	Variation of protective covering:	with cover of 64 mm or less …….07mm
		with cover of more than 64mm …….. 13mm
-	Variation from indicated spacing	..... 26 mm

(9) **Backfill for Tower Footings**

Backfill shall be placed about the tower footings to elevations indicated on the drawings or as directed. The material used for backfilling, the amount thereof, and the manner of depositing this material shall be approved by the Engineer. Where the excavated materials are insufficient in quantity or are not suitable, as determined by the Engineer nominated person, for use as backfill, the Contractor shall obtain suitable material from the borrow. No borrow pits shall be made within 25 meter radius from center of tower. Backfill shall be placed about the tower footings as soon as practicable after removal of concrete forms, but not earlier than 8 hours from application of sealing compound or bitumen coating to concrete surfaces.

The excavated material not suitable for backfilling or in excess of backfilling requirement shall be spread evenly over or adjacent to the Site. The backfill adjacent to footing stems shall be approximately 150 mm above the original ground, and shall be graded and sloped uniformly away from the stems so that there is no pond at or around the footing.

In backfilling for concrete footings, the pad of the footing shall be covered with fine material of 300 mm thickness (after compaction) before any coarse material is deposited. Care shall be taken to avoid damage to the concrete when backfilling. The backfill material shall be clean and free from vegetation, pieces of timber, or other foreign matter. Suitable material for backfilling shall be a compatible granular material having a granularity within the following limits.

Sieve	% Passing
76 mm (3 in)	100
No. 200	0-15

(10) **Compacting Backfill**

Backfill shall be placed in horizontal layers which after compaction shall not be more than 150 mm thickness. Each layer shall be compacted by tamping machines or other mechanical means approved by the Engineer.

Backfill shall be moistened properly where required. When excavated material is so wet that it is not suitable for backfilling, it shall be spread and aerated until the proper moisture content is attained, at which time the material shall be used as backfill around tower footings. The backfill material shall not be placed until all forms and timber used for shoring or bracing have been removed, unless otherwise permitted by the Engineer or his nominated person.

The Contractor shall submit, for laboratory testing and approval, representative samples of the materials proposed to be used as backfill. On the basis of laboratory test results the Engineer shall specify the degree of compaction to be obtained in the field, which shall not be less than 90% of the maximum dry density as obtained by ASTM D-1557.

Density shall be measured in the field according to ASTM D1556 or ASTM D2937 by the Contractor in the presence of nominated person of the Engineer to determine compliance with

the specified degree of compaction. The cost of all laboratory and field testing shall be borne by the Contractor.

(11) **Additional Foundations**

In case other foundations are required to be installed, which are of different design than the specific types listed, the Contractor shall install these foundations as directed by the Engineer. All work performed will be in accordance with these Specifications. Payment for additional foundations will be made at the applicable unit prices provided in the Price Schedules for similar Works.

(12) **Foundation Test** (Not Required)

The Contractor may be required to perform an uplift load test on any one footing for double circuit suspension type tower. The Engineer will designate the location and type of footing to be tested. All methods, procedures, equipment, jigs, apparatus etc., shall be subject to approval by the Engineer. No testing shall be commenced until 28 days after the final concreting nor until all backfill is placed and compacted as specified herein.

An uplift load shall be applied until a design value is reached or the footing fails. The rate of load application will be determined by the Engineer.

20 Pile Foundations

(1) General

(a) Description of Work

The Work to be performed under these Specifications shall be carried out at the proposed site of towers after the field and laboratory test results confirmation. The Work includes, but is not limited to the following:

(i) Construction of bored, cast-in-place reinforced concrete piles, pile cap and tie beam as shown in the Bid Drawings or as directed by the Engineer

(ii) Complete borehole logs and record of all operations performed during the execution of the Work.

(b) Location of Piles

(i) The location of piles on the ground shall be established by the Contractor in accordance with the construction drawings. Establishing the pile locations accurately in the field shall be sole responsibility of the Contractor.

(ii) The Contractor will provide the levels, survey and ground elevations for each pile location. The elevations will be given with respect to permanent Bench Marks in the vicinity of the Site.

(c) Diameter and Length of Piles

Bored, cast-in-place reinforced concrete piles shall be constructed having uniform diameter throughout the length as specified in the relevant Bid drawings or as directed by the Engineer. Pile footings shall only be installed where the field and laboratory tests confirm the requirements. The final length of the piles shall be determined based on field and laboratory test results.

(d) Drillers and Supervisory Staff

The Contractor shall have at Site, at all times only qualified, experienced, orderly and thoroughly competent persons including graduate civil engineers/geologists who shall conduct and supervise drilling/concreting operations during, sampling, logging, in-situ testing and piles construction.

(2) **Execution of Piles**

(a) General

This clause covers all the work necessary for the execution of the bored, cast-in-place reinforced concrete piles namely:

(i) Formation of ramp.
(ii) Drilling and stabilizing of bore holes for the piles.
(iii) Placing of steel reinforcement.
(iv) Mixing and placing of concrete.

The Contractor shall perform all such work in accordance with requirements of this clause as well as in accordance with the methods proposed or descrybed by him at the time of submitting his Bid and approved by the Engineer.

(b) **Method of Drilling**

The drilling of holes for piling shall be done by reverse rotary or percussion method or any other method suggested by the Contractor and approved by the Engineer. Regardless of the method used for drilling holes, drilling operations shall be carried out in such a way as to avoid any disturbance of the surrounding soil especially at the bottom of the hole and successful drilling through all types of soil/rock/boulder.

(c) **Stabilizing of Holes**

There will be no permanent casing installed. Any temporary protective casing at the start of the drilling shall be later pulled out. The stabilizing of the drilled holes shall be achieved by using natural or commercial drilling mud/bentonite. Permanent casing shall only be allowed with the prior approval of the Engineer.

(d) **Tolerances**

Tolerances for setting out and for concrete construction shall conform to Clause 1.3 of these Technical Provisions. In case of piles, deviation from the vertical shall not exceed one percent on any section of the length of the holes.

(e) **Concrete**

All concrete and reinforcement placed in the construction of piles shall conform to the requirements of Clause 1.3(8) of these Technical Provisions. In addition to this, following requirements shall also be fulfilled.

(i) Promptly after cleaning of the borehole to the entire satisfaction of the Engineer Representative, concrete shall be placed in a manner that will not cause segregation of the particles or permit infiltration of water or any other occurrence which would tend to decrease the strength of the concrete or the capacity of the finished pile. The slump shall be 150-180mm.

(ii) The minimum clear distance between vertical reinforcement, including lapped bars, shall be 100 mm (if applicable).

(iii) Either tremied or pumped-in concrete can be used in presence of water or of drilling mud. Tremie or pump pipe shall be made of steel and have watertight joints. Tremie pipe shall have a minimum diameter of 8 inches (200 mm) and

pump pipe shall have a minimum diameter of 4 inches (100 mm) should be used. Embed tremie or pump pipe a minimum of 3 meters in the concrete throughout concreting. The method and equipment used shall be subject to the prior approval of the Engineer.

(iv) Concrete placement shall proceed without interruption until the pile is complete.

(v) Vibrate top 3 to 4 meters of concrete after temporary casing has been withdrawn.

(vi) The Contractor shall make three test cylinders per pile or as directed by the Engineer during the concreting of piles.

(vii) The vertical bars of pile can be coupled together as directed by the Engineer according to the site requirement.

(viii) The inner dia of stand casing/permanent casing should be at least 25mm larger than the pile dia, whereas bit dia should be equal to pile design dia.

(f) **Record**

The Contractor shall keep accurate logs and records of all the Work accomplished under this Contract. All such records shall be preserved in good condition by the Contractor until they are delivered and accepted by the Engineer. The Engineer shall have the right to examine such records at any time. The following information shall be included in the records for each pile.

- A general description of sub-soil conditions and water table position at the location of the pile.
- Pile number, ground elevation of borehole and elevation of top of pile.
- Type of drilling operations.
- Date and time by depths when drilling operations were performed and piles constructed.
- Total depth of each borehole.
- Quantity of concrete and steel used for the construction of each pile.
- Quantity of constituents for each batch of mix, water cement ratio and the results of all quality control tests.-
- Time of start and completion of Concrete.
- Remarks concerning any unusual occurrence during drilling and concreting of piles.

21 **Dismantling of Towers**

The dismantled Towers are envisaged for reuse/re-utilization by the employer in other projects. Proper handling and safety of the tower components/members during dismantling, counting & recording of each component/member, bundling/packing, storage at site and safe transportation of material to employer designated warehouse shall be included in the scope of work. The contractor shall be entirely responsible for any damage to the tower members/components during execution of work. In case of any damage/breakage/loss of tower members/components, recovery shall make from the contractor by employer.

The contractor shall also make every effort to minimize the breakage/loss of dismantled fasteners (nut & Bolts, washers, step bolts etc.) during execution of work. However, if breakage/loss of fasteners is inevitable, the same may be allowed/approved by the Engineer.

22 **Tower Erection**

(1) **General**

Contractor's work includes supply of manpower, providing construction equipment, vehicles, rigging tackles for complete assembly of towers.

Erection shall be done strictly in accordance with the approved manufacturer's drawings, material lists and approved construction data sheets.

No tower shall be erected until seven days after the last concrete was placed in the foundation, nor until backfill has been completed where and as required.

(2) **Handling**

Tower steel shall be handled so as to prevent deformation of the members and damage to the galvanizing. Materials shall not be dumped, dragged, barred; rolled or dropped but shall be carefully loaded, unloaded and stored. A mechanical means such as hoist or crane shall be used when material cannot be properly handled or placed by hand.

Bare wire rope or steel chains shall not be used for handling without adequate protection of the surface coating. Heavy members shall not be stacked on top of lighter members. Structural members shall be stored according to size, lengths and markings. The maximum weight of steel bundles shall not exceed a specified weight, typically 1600 kg to 1800 kg, to facilitate handling and unloading. Members with dissimilar finishes shall not be stored over one another to minimize discoloration of the lower members.

All members shall be placed on wood blocking or other suitable material to ensure that the materials to be stored are not in contact with the ground. Blocking shall also be used to separate layers of stacked materials. Members shall be supported in such a manner as to prevent bending and distortion as well as to allow water to drain from the materials.

Failure to provide for proper drainage of stacked galvanized steel members could result in the formation of white rust. White rust (zinc oxide) forms when two galvanized surfaces are closely rested for an extended time without adequate ventilation. Ingress of water between the surfaces forms an electrolytic cell, which may, in time, erode some of the zinc layer. The white rusting action will stop after exposure to air. Spacers placed between the nested pieces ensure adequate ventilation when extended transport storage is anticipated.

The material yard shall be kept relatively neat and clean and the growth of vegetation kept to a minimum. Good housekeeping minimizes damage and loss of material handling; periodic physical inventories and complies with environmental considerations.

(3) **Assembly Methods**

All assembly and erection shall be done by methods and equipment that will not cause damage to, or distort any part of the tower. Extreme care shall be taken to establish and maintain the true geometric shape of the sections of tower assembled.

Preassembly techniques are generally influenced by site terrain and available equipment. Generally, the larger section that can be pre-assembled, the more efficient is the assembly/erection operation. Preassembly techniques shall consider placement of the assembled sections to provide for the most efficient, safe lifting for erection. Structural assemblies, which are not sufficiently rigid to be raised in one piece, shall be stiffened by means of adequate temporary bracings.

Towers assembled on the ground shall be placed on suitable blocking so as to be kept free of dirt, mud or other foreign material that might adhere to the structure and damage the coating. Blocking shall be placed in such a manner as to provide a flat surface in order to prevent over stressing or distortion of members and to maintain the true geometric shape of the assembled members. Mud, dirt, white rust and other foreign material shall be removed from the contact surfaces of joints prior to assembly. Steel members shall not be dragged over the ground or otherwise handled in such a manner as to damage the galvanizing.

The structures shall be assembled in accordance with the fabricator's erection and detail drawings. The diameter, type, and length of bolts as shown on these drawings shall be used for each connection. Orientation of bolts can facilitate access, final tightening and installation of locking devices and subsequent checking of the erected structure. Tower bolts shall normally be installed so that the nuts are to the outside of the tower or, in the case of horizontal members, to the top of the connection unless such positioning is clearly impracticable.

Installation of bolts by hammering or any method that damages the galvanized coating shall not be allowed.

When sections of towers are being assembled prior to erection, assembly shall be on blocks that will provide support, sufficient to prevent distortion of tower steel. If all bolts in an assembly are not inserted, at least 50 percent of the bolts in each connection shall be inserted and those bolts shall be finger-tightened only. All bolts in an assembly shall be inserted before any bolt in the assembly is fully tightened.

Only wrenches which properly fit the nuts and bolt heads shall be used. The use of wrenches, which in any way deform the nut or cut or flake the galvanizing is prohibited. All bolts shall be entered clear to the head. All 16 mm diameter bolts shall be tightened to a torque of 10-14 kg - meters and 20 mm and 24 mm diameter bolts to a torque 17-23 kg-meters. All bolts after torque shall be center punched adjacent to the nut in order to prevent loosening of the nut. This method of locking the nuts will be used instead of locknuts.

(4) **Method for Erection**

Towers shall be erected by any suitable method in the sequence best adapted to the equipment, workers' experience and site conditions which will not overstress structure members.

When handling assembled portions of the structure, spreader bars or other devices with proper points of attachment shall be used to avoid distorting or overstressing members and to maintain the true geometric shape of the section.

Adequate tag lines shall be used to ensure that no section of the tower being lifted will drag on the ground or against any section of the tower already erected.

Temporary guying may be required when erecting a structure in sections. Any temporary guying system shall be checked to ensure that the structure section is stable before workers are allowed to work on the section.

Structures shall be completely erected, correctly oriented, with all members in place, all bolts installed and properly tightened, and the entire structure checked in accordance with the specifications prior to the installation of insulators, conductors and OPGW.

When erecting structure members or sections in the vicinity of energized lines, care shall be taken to ground these members or sections before any workers come in contact with them.

The use of a crane erection is generally an efficient method of erecting latticed steel structures. With ground pre-assembly of sections, the time spent in final erection can be greatly reduced.

Cranes with telescoping booms can be more efficient than rigid boom cranes in rough terrain. Considerable productivity can be lost in the process of assembly and disassembly of rigid boom cranes. In addition, continuous handling of boom sections can lead to boom damage. Preplanning of the crane location at the structure site allows for any necessary grading work (building of ramps, soil stabilization etc.) to be accomplished during the foundation construction operations when suitable equipment is available at the site. Depending on soil conditions, additional bearing support may be required under outriggers, tracks, and tires. All soil shall be returned to a condition acceptable to the Engineer after erection.

Gin Pole is a boom of steel or aluminum pipe, wood pole or latticed truss secured at its base and usually inclined at a slight angle to the vertical is also used for tower erection. Two wire-guys about 60º to 90º apart in the plan view are attached to the top of the gin pole to resist or support the load to be lifted. For safety, a third, and preferably a fourth guy, is installed in front to prevent the pole from falling over backward in the event of an unexpected impact or the sudden release of load.

(5) **Correction of Mis fabricated and Damaged Steel**

All shop errors and damaged steel shall be reported to the Engineer who will decide the manner in which corrections shall be made. All costs incurred due to punching, drilling or cutting shall be deemed to be included in the steel erection cost.

Pieces bent in handling may be used if they can be straightened to the satisfaction of the Engineer, without structurally damaging the metal. If bent pieces cannot be satisfactorily repaired, they shall be replaced.

Field punching or drilling of holes and field clipping shall be done only with the approval of Engineer, if the hole or clip was missed in fabrication of the member but was called for on the fabrication detail drawings. The edges of clipped angles, new or reamed holes or any member which has its coating scratched or damaged shall be repaired with a coating approved by the Engineer. Members having mis-punched holes shall not be repaired by welding and shall be replaced with correctly fabricated members. If the field fabrication of a member is required, the bolt spacing and edge distances shall be in accordance with the fabrication detail drawings.

Reaming shall be done only with the approval of the Engineer, and will be permitted, for the correction of undersized holes, for removing excessive galvanizing, and for holes off gauge line, to the extent that the connection cannot be made by loosening bolts in related connections. No hole shall be reamed more than one-eighth of its original diameter.

Reaming to remove fitting difficulty due to improperly set footings, to correct improper tower assembly and erection, that would distort holes or distort any member, or that would damage the galvanizing, is prohibited.

(6) **Damage to Galvanizing/Paint**

Small areas of galvanizing damaged by abrasion, in straightening bent pieces or by necessary clipping-in the field, shall be repaired by carefully cleaning the affected area and painting.

Damaged area shall be wiped with clean rags saturated with Xylene or equivalent solvent, followed by wire brushing then recleaned with solvent to remove residue, and painted with one coat of "Galvanox", or approved equivalent.

Galvanizing damaged by drilling or punching shall be repaired by applying an Aluminum paste or zinc rich coating material to completely fill all voids between the bolt and the surfaces bared, or all exposed steel surfaces around the holes or on cuts on which such corrective work is permitted. The coating material shall be "Galvanox" or approved equivalent.

(7) **Tower Signs and Aerial Markers**

Material

All the plates i.e. danger sign, number & phase plates and aerial markers shall be baked ceramic surfaces on high grade steel base plates of minimum thickness of 1.5 mm except aerial marker plate which shall be of 3.0 mm thickness. The fabrication details and dimensions of the plates are shown on the drawings in Volume-II: Drawings.

The plates shall be painted with ceramic paint on both sides and shall be thoroughly cleaned before painting and the ceramic paint shall completely cover the front and back of the plates

and also the edges of plates and the interior edges of the attachment holes. The ceramic paint shall be of even thickness, reasonably free from cracks, patches, pin holes, blisters and shall have a uniform gloss. The ceramic paint around the holes shall be protected by means of fiber washers.

Three coats of ceramic paint shall be applied on the danger sign and number plates. The first coating of black ceramic paint shall be applied on both sides of the plates. The other two coats of white ceramic paint shall be applied on the front side of the danger & number plates and yellow on aerial marker plates.

In case of phase plates, three coats of ceramic paint shall be applied. The first coat of black ceramic paint shall be applied on both sides. The other two coats of red, yellow and blue colour shall be applied as specified on both side of the plate.

Nos. of bolts, nuts, washers and fixtures where required shall be supplied with each plate as shown in the drawings. Bolts, nuts and washers to be supplied with the fixture shall be galvanized in accordance with ASTM A153.

Acceptance Tests

The following acceptance tests for Sign & Number Plates and Aerial Markers shall be carried out:

(i) Visual examination
(ii) Verification of dimensions
(iii) Galvanizing test (on fixture and nuts & bolts only)
(iv) Resistance to thermal shock (vitreous enamel finish)

(i) Visual Examination:

Examination	Defects
a. Construction	Not of the shape given in relevant Drawing. Any crack on the nut& bolt.
b. Material	Not of proper material.
c. Finish	Galvanizing of bolts, nuts, washers and fixture not proper, presence of black spots, blisters, flux, dress, un-coated areas or any other defects. Bolts and nuts, rusty. Threads marred. The plates not properly enameled or presence of cracks, patches, pin-holes, blisters or any other defect. Letters and numbers broken or not properly enameled.
d. Marking	Missing or in-complete or not as per drawing.

(ii) Verification of Dimensions:

Dimensions of the danger, number, aerial markers, phase plates and fixtures shall conform to those given in drawings in Volume-II with allowable tolerances as marked on the individual drawings. Any variation from the specified dimensions shall constitute a defect.

(iii) Galvanizing Test:

The galvanizing of the nuts, bolts, washers and fixtures shall be tested in accordance with ASTM Specifications.

(iv) Resistance to Thermal Shock:

This test shall be carried out by subjecting the test specimen to radiant heat so as to reach a steady temperature of 185-195°C in about ten minutes. The temperature shall be measured by means of a surface pyrometer in contact with the top surface of the heated part of the specimen.

Remove the radiant heat and within 5 seconds quench the surface with 1000 ml of water at 15-20°C direct from an aspirator or other container through a 5 mm diameter tube, the end of the tube being 150 mm above the center of the heated portion of the test specimen. The flow rate of water shall be adjusted to 10 ml per second. It is convenient to mark the test area to ensure that the water is correctly applied. Dry the plate, replace in the same position under radiant heat source and repeat this procedure until six cycles have been completed.

After subjecting the test specimen to the above test, the vitreous enamel surface shall be considered to be resistant to thermal shock provided that the enamel shows no signs of flaking-off or crazing.

Sampling, Acceptance and Rejection:

Danger, number, phase plates, aerial markers and fixtures offered for acceptance shall be divided into lots containing up to 200 units in each lot. A sample of 12 units (3 each from danger, number, phase and aerial marker) shall be drawn at random from each lot. For thermal shock test two samples each shall be randomly selected from the offered lot.

The selected samples shall be subjected to the visual examination, verification of dimensions and galvanizing. If the number of defective units is two, the lot shall be accepted. If the number of defective units is more than two the lot shall be rejected. If the number of defective units is three, another sample of 12 units shall be selected at random and subjected to tests. If the number of defective units is again three or more then the lot shall be rejected and if the number of defective units is less than three then the lot shall be accepted.

Installation

Tower signs (danger sign and number signs) shall normally be installed on the tower so that they will be readily visible when viewed in the direction of increasing tower numbers. However, if signs installed in the normal position will not be readily visible from a permanent access road, they shall be installed on the tower faces best exposed to view from the access roads. These signs shall be supplied by the Contractor, and before the manufacturing, a sample shall be submitted to the Engineer for approval.

Aerial markers shall be installed on the upper side of bridge structure, as shown on the drawings. Two markers shall be installed on every tenth tower of the line; one marker faced back on line and the other ahead on line. These shall also be supplied by the Contractor.

(8) **Anti-climbing Devices**

Material

Material, dimensions and testing of the barbed wire shall be in accordance with ASTM A121.

The size and characteristics of the zinc coated barbed wire shall be as per design number 12-2-4-14R, Type Z with Class 3 coating.

The material of structural steel of anti-climbing devices shall be maximum of mild steel as per ASTM A36 and galvanization ac cording to ASTM A153.

Acceptance Tests

The following acceptance tests for barbed wire shall be carried out:

(i) Visual examination
(ii) Verification of dimensions
(iii) Galvanizing
(iv) Physical
(v) Mechanical

These tests shall be carried out on the selected samples as per the test procedure defined in the relevant ASTM specification.

Installation

An anti-climbing device will be installed on each tower as shown on the relevant drawings. The anti-climbing device normally will not be installed until all the tower and wire stringing work is completed.

The tower steel will be provided with holes for mounting the anti-climbing device brackets. The brackets shall be fabricated from mild steel and shall be galvanized in accordance with ASTM A153. The brackets along with barbed wire shall be supplied by the Contractor. Any holes required to be punched/drilled for installation of Anti-climbing Devices and applying of Galvanox, shall be carried out by the Contractor without any extra cost.

Anti-climbing device will be provided with an arrangement of barbed wire around the tower to prevent unauthorized person(s) from climbing the tower.

After erection, tower shall be cleaned of any foreign matter.

(9) **Supporting Device for Joint Boxes of OPGW**

Supporting device for joint boxes of OPGW to be designed, manufactured and supplied by OPGW manufacturer will be installed on the towers where joint boxes are required to be installed. Joint boxes will be installed on the tower on completion or just before completion of each OPGW reels of about 3.2 km length or wherever particularly required. The holes required to be drilled in the tower braces for installation of these supporting devices including provision and applying of Galvanox at the holes drilled shall be responsibility and to the cost of the Contractor.

(10) **Welding of Nuts & Bolts**

All nut & bolt connections of all types of towers shall be welded according to drawing in Volume-II, up to 8.0 m height from the top of chimney. After welding, cold galvanized paint (zinc rich paint) having at least 90% zinc content shall be applied to the welded portion. At least two coats of the paint shall be applied. The cost of welding including application of paint shall be deemed to be included in the unit rate/tower quoted.

23 **De-Stringing/Dismantling of Conductor, Earth wire, Insulators & Hardware etc.**

The contractor shall be entirely responsible for any damage to the tower or during execution of work. Necessary calculations shall be carried out by the contractor to ensure that the loading on towers due to conductor tension as well as loads on account of de-stringing or re-conductoring activities shall be within limits.

Towers not designed for sided stringing shall be well guyed to avoid damage. In this respect, all the expenditure related to this work is deemed to be included in the price schedule and no extra payment shall be made.

Dismantled stringing materials (i.e. conductor, shield wire, insulators and associated hardware etc.) shall become property of the contractor. The contractor shall be responsible for the removal of dismantled

material from the Site or otherwise disposed off the dismantled material. Therefore, the contractor is required to estimate the valuation of the dismantled material and fill the same in Item No. H of BoQ.

24 Installation of RTV Coated Insulators and Hardware

Insulators and insulator hardware shall be assembled and installed as shown on the drawings and in accordance with the recommendations of the manufacturers.

No insulator with chips or cracks in the porcelain or defects in the fittings shall be installed.

Uncrated or otherwise unsupported strings of insulators shall not be picked up or suspended except by the upper units of the string. All cotter pins installed by the Manufacturer shall be checked.

All insulators shall be cleaned with a clean cloth when installed. The porcelain shall be bright and all other parts free from dirt. Only clean rags free from any abrasive material shall be used for cleaning insulators.

Wire brushes shall not be used for the cleaning of any parts, metal or otherwise. The use of solvents will not be permitted.

Each completed suspension assembly shall be adjusted to hang in a vertical plane through the axis of the tower. Where it would be possible, nuts, locknuts and cotter pins shall be placed to face the tower body.

Workmen shall not climb on insulators during stringing operations or at any other time.

When raising conductor strain assemblies, the insulators shall be kept under tension to avoid possibility of those being damaged due to excessive bending.

25 Stringing Conductors and OPGW

(1) General

The conductor and OPGW shall be installed as shown on the drawings and as specified herein.

(2) Safety Grounding

It shall be the Contractor's responsibility to take adequate safety precautions to protect his employees and others from the potential voltage build-up during construction. The voltage build-up may be comparatively small during normal operations, but could be lethal during switching and ground fault conditions on the energized parallel line. The following minimum safety and grounding procedures shall be followed by the Contractor during stringing operations in the Sections with parallel existing high voltage lines.

Temporary electrical grounds shall be placed at both ends of the section requiring special safety precautions and at intervals along the line which is under construction. The grounding sets installed at both ends of the section of line shall remain in place until the completion of the work and shall be removed as the last phase of cleanup. Hot stick shall be used for installing and removing the grounding sets.

All temporary grounds furnished and installed for protection shall be clearly visible for inspection and shall be flagged by use of a red cloth placed at the point of grounding. All grounds, except those placed at both ends of the section, and red flags shall be removed when they are no longer needed for protection.

All pulling and tensioning equipment shall be bonded and effectively grounded with approved-type driven grounds securely attached to the equipment. At least two driven grounds shall be used at both the pulling and tensioning set up. All conductive parts of the tensioning set up and equipment shall be operated from grounded or insulated platform provided with barricades or insulated walkways.

Running grounds shall be installed within 6 meters of the tensioning set up to constantly ground each sub-conductor and OPGW. At the pulling set up grounding shall be achieved by the use of block grounds connected to the adjacent tower by approved type ground leads bonded to the tower with approved type clamps. These connections shall be removed by the use of a hot-stick.

An approved-type driven ground shall be located at each side and within 3 meters of working areas where conductors or OPGW are being compressed to dead-end assemblies or spliced at ground level or jointed. The two ends to be spliced shall be effectively bonded together prior to and during splicing operation. Splicing and compression operations at dead-end assemblies shall be carried out on either an insulated platform or on a conductive metallic grounding mat roped off with an insulated walkway provided for access to the mat.

Installation and removal of temporary jumpers, at any time the conductor is not continuous, shall be performed by hot stick methods.

All conductors and OPGW shall be bonded to the tower with approved-type tower grounds at any isolated tower where it may be necessary to complete Work. Work on dead-end towers shall require grounding on both sides of the tower. Grounds may be removed when the Work is completed, providing the line is not left open circuited at an isolated tower at which work is being completed.

For all sections of the line under work, which are not in parallel with energized high voltage lines or otherwise requiring special safety precautions, only the provision of the grounding at the pulling and tensioning stations shall be required.

All provisions specified herein shall not prevent the Contractor from installing as many additional grounds as deemed necessary for the protection of workmen against static and accidental contacts with foreign circuits.

Clipping crews and all others working on the conductive pulling lines, isolated conductors or OPGW shall be protected by individual hot stick clamp type grounds installed at every work location.

(3) **Approved Type Grounding Material**

Approved type moving grounds shall be such as to exert constant pressure on the conductor or OPGW, and the contact rollers shall be with permanently lubricated-type bearings.

Approved-type driven ground rods shall be minimum of 16 mm diameter copper-weld or equivalent. Ground rods shall be driven into the ground a minimum of 2.5 meters.

Approved-type tower grounds shall be hot stick clamp grounds, bonded to the tower with a flexible ground lead.
Approved-type ground leads shall be at least 43 mm² cross-section copper or equivalent.

Approved-type insulated platforms shall be constructed of 65 mm nominal dimension lumber supported on 102 mm nominal dimension sills, or of materials of equivalent insulation.

At the tensioning set up, the insulated platform and rope barriers shall extend completely around the equipment set up in such a manner as to prevent any one standing on the ground from contacting any conductive part of the equipment.

(4) **General Safety Precautions**

Prior to initiation of the stringing in any section of the line the following shall be insured.

(a) The installation of all towers within the section of the line is satisfactorily completed.

(b) The stringing loads will not exceed the design loads for any of the towers.

(c) If any tower is to be subjected to loads exceeding the design loads, the Contractor shall provide temporary bracing for such tower, and the bracing is subject to approval by the Engineer.

(d) The stringing and sagging operation is such that no sudden loads will be applied on the towers.

(5) **Safety Precautions at Crossings**

Wherever any power line, communication line, highway or railroad is to be crossed, the owners shall be notified 30 days in advance and all temporary changes shall be pre-arranged.

The Contractor shall not erect towers near, or string conductors or or OPGW over energized power circuits until a Hot-Line Order is placed on the energized line.

Qualified personnel shall remain at the site of work while the Hot-Line Order is in effect and shall ascertain that all personnel are in the clear and properly notified before the Hot-Line Order is released.

All existing lines which are de-energized for crossing shall be short-circuited and grounded at each side of the crossing.

Guard structures shall be provided at all crossings, as required for the protection of the conductor, line, road, structure, or feature being crossed, and as required by the owner, or the Employer.

Guard structures shall be of sufficient strength and stability to withstand the stresses to which they may be subjected.

As soon as a guard structure has served its purpose, it shall be removed and all holes shall be backfilled.

(6) **Atmospheric Adverse Conditions**

All pulling and stringing operations shall cease when either wind velocities are such as to cause conductors to deflect more than 1.5 meters at mid-span from the normal no wind position or there is any indication of lightning activity in the area.

(7) **Handling and Stringing of Conductors**

The conductor will be furnished in matched sets of twenty four (24) reels and shall be strung by the controlled tension method. At no time will the conductor be allowed to contact the ground or any object which might cause damage to the conductor.

All reels shall be inspected in the field prior to installation. Reels showing signs of careless or unusually rough handling, such as split frames or crashed outer protective lagging shall be inspected carefully for conductor damage.

Preparatory to un-reeling a conductor from the reel, the outer protective lagging shall be removed carefully, and all surfaces in contact with the running conductor shall be examined for protruding objects which might damage the conductor.

Care shall be taken to insure that no dirt is carried by the conductors from the reels. Reels shall be properly cleaned before starting stringing operation of any line section.

A spreader bar shall be used when lifting or lowering the reels. Full or partial reels shall not be dropped or rolled under any circumstances.

The four conductors in a bundle shall be strung simultaneously and shall hang in stringing blocks for the same period of time not exceeding 24 hours and, in exceptional cases, up to 48 hours before being sagged to the specified sag.

Four conductors shall start and end approximately at the same points of the line and stringing operations shall be planned to keep waste to a minimum. Lengths of conductor less than 100 meters are scrap lengths and shall not be spliced into the line without the approval of the Engineer. Jumpers shall be cut only from scrap lengths unless otherwise permitted.

Stringing sheaves may be hung on the insulator strings or in straps of equal length attached to the structure arms with suitable hooks or clamps. The sheave shall support the conductors at the same elevation as when clipped in.

Stringing of conductors and temporary guying of conductors shall be done by methods that will prevent damage to the conductor and structures in any way. Temporary guying/dead ending to tower footings will not be permitted. Where temporary dead end is required, the conductors shall be attached to suitable temporary anchors.

The general requirements for installation of the temporary anchors are as follows:

The angle formed by conductors/OPGW to the horizontal shall not exceed 15 degrees.

The anchors shall be aligned in the direction of stringing:
The anchors and their accessories shall withstand the maximum conductor tensions with a factor of safety of three.
Four sub-conductors of one phase shall be strung simultaneously by means of running board attached to a single pulling line with a swivel. Sub-conductors shall be connected to the running boards with a swivel connection and a stocking-type grip. The grips shall be secured to the conductor by means of a band installed around the tail end of the grip.

Following stringing, measures shall be taken to prevent the sub-conductors of the bundle from contacting each other. Before adjusting the sag of the conductors, sub-conductor slapping may be prevented by pulling each of them to a different sag which will separate them at least 153 mm vertically from either of the other sub-conductor at mid-span. After adjusting the sag, the following conditions will require sub-conductors tie-off: any time that sub-conductors slapping is noted, any time that prior to spacer installation the conductors are left unattended.

Two reel lengths of conductor may be pulled into the sheaves using only approved swivels and grips to make the connections between reel lengths. Double socking will be permitted, but permanent splices shall not be pulled through a sheave or bull-wheel.

All sheaves, swivels and grips shall be inspected daily for free and easy movements and to assure that such may be safely used. Sheaves carrying pulling lines shall not be used for conductors.

The conductor shall be kept clean by removing grease, dust or any other contamination. Cleaning shall be done immediately after the conductors leave the tensioning device. The method of cleaning shall be wiping with a clean cloth saturated with proper cleaning agent. When it is necessary to slack the conductor at any time during the stringing operation, it shall be done with the approval of the Engineer. Rigid plank guard or lagging, or a combination of both shall be used to prevent damage. Lagging shall consist of nonmetallic material which will not damage the conductor and shall be rigid so that it will not be displaced by the motion of the conductor. It shall be free of any material, which can be transferred to the conductor.

Sections of the conductor damaged by application of gripping attachments or any other way during stringing shall be removed before the conductor is sagged in place.

The conductor repairs shall be done as outlined in Clause 1.7(11) (b) of the Technical Provisions.

All stringing operation must be conducted so that at no time will any suspension structure be subjected to longitudinal loads and at no time will any tension structure except dead end structure be subjected to excessive unbalanced loads resulting from longitudinal loads on opposing faces. At no time shall any structure be subjected to torsion. The vertical angles of pulling lines shall be such as to minimize the vertical loading on towers. The attachment of temporary guys and stringing equipment on towers shall be done only with approval of the Engineer.

The conductor reels, tensioners, and pulling machines shall be located as near to mid-span as possible but in no case shall the slope of the OPGW or conductor between any machine and the stringing block or any anchor lead be steeper than three horizontal to one vertical (15°-20° to the horizontal).

The tension in the conductor during stringing shall be maintained as constant as practicable. The sag in each conductor must be maintained at least 20 percent greater than the sagging value specified in sag charts and the maximum pulling tension shall never exceed the sagging tensions.

If the conductor is left unattended, during stringing operations, it shall be freely suspended between stringing sheaves so as to provide a safe clear distance over ground or obstructions.

The minimum tension shall be such as to maintain the conductors at a minimum distance of 3 meters above ground or any obstacle.

When there is possibility of conductor being damaged due to wind or other conditions they shall immediately be fully tensioned. It is recommended that variations in stringing tensions be as small as possible and the tension shall be near the maximum permitted. Immediately after completing stringing of a section of the line, the tensions shall be increased to the maximum permitted stringing values.

The spinning of the conductors and OPGW shall be prevented during stringing. Unreeling of the conductors shall be closely watched at all times in order to detect any damage or flaw in the conductor.

(8) **Handling and Stringing of OPGW**

One 12mm OPGW shall be strung for the entire length of line. The specifications used for handling and stringing the OPGW shall be the same as for the conductors.

(9) **Conductor Sagging**

After being pulled into the sheaves all sub-conductors in a sag section shall be sagged within 24 hours.

The conductors shall be sagged in accordance with sag charts, furnished by the Contractor. The exact value of sag for a given span length at a given temperature can be ascertained from the appropriate table or by linear interpolation of data.

Conductor sagging temperature shall be measured by an accurate thermometer. A length of core shall be pulled from a 0.5 meter length of the conductor sufficient for thermometer to be inserted into the space vacated by the core.

The length of conductor shall be placed in the full sun at least 4 meters above the ground for a minimum period of 15 minutes. A thermometer in a container which stimulates the effect of the conductor may also be used.

The length of conductor sagged in one operation shall be limited to the length that can be sagged satisfactorily, usually 3,000 meters to 6,000 meters.

Temporary snubs shall be used between a section previously sagged and clipped in and the section being sagged. Dead ending or snubbing will not be permitted on any tower except dead end towers at the normal point of attachment.

When conductors are sagged a mark shall be placed on each conductor at the last structure in each pull. The location of this mark shall be checked after the succeeding sag has been made to ascertain whether or not the back spans are still sagged properly. The wire grips may be removed only after the next section of the line has been sagged.

When sagging conductor shall have lengths of more than four spans, the sag shall be checked near each end span and at or near the middle span of the length being sagged. The length of the spans used for checking sag shall be as nearly equal to the ruling span as practicable.

The sag of each span more than 600 meters in length shall be checked in addition to above. Sag at sharp vertical angles and horizontal angles of 10 or more degrees shall also be checked on both sides of the angle.

The sags shall be determined by means of a transit or other approved methods. At least one person shall be provided to measure the correct sag for pulls up to five spans, two persons for six to ten spans and three persons for eleven spans or more.

The total number of spans to be checked shall be not less than two in a four-span section, three for a section up to two kilometers and in proportion for a longer section.

In the quad conductor bundle the sag of the two upper sub-conductors shall be the same. The lower sub-conductors shall be sagged from 30 to 60 mm more than the upper sub-conductors.

A tolerance of plus or minus 10 mm of sag per 30 meter of horizontal span length, but not to exceed 150 mm in any one span, will be permitted, provided that: (1) upper sub-conductors in the span assume the same sag; (2) the necessary ground clearance is obtained; (3) the conductor tension between successive sagging operations is equalized so that the suspension insulator assemblies will assume the proper position when the conductor is clipped in; (4) the sag in the lower sub-conductor of the bundle is 30 to 60 mm more than the sag in the upper sub-conductors.

Log books shall be maintained to record all conductor installation data and chronological progress.

The temperature, spans, tower, general weather, wind velocity and direction, sags, tensions, and drawing references shall be recorded for each section of conductor as it is being installed, tensioned and sagged. When possible, sagging operations shall be scheduled when wind velocity is at or near zero.

Radio or telephone communication shall be used to relay information and instructions between the conductor payout station, intermediate check points, mobile stations and the pulling stations at all times during stringing operations. A failure of communication requires immediate cessation of the conductor pulling operation.

(10) **Conductor Clipping-in**

After being sagged, the conductor shall be allowed to hang in the stringing blocks for not less than 2 hours before clipping-in is commenced, to permit the conductor tension to equalize.

Plumb marks shall be made on the conductors in the vertical plane through the centerline of the tower prior to clipping-in. Only paint, crayon, or wax pencil shall be used for marks on conductors.

All conductors marking in the section being sagged shall be accomplished while the conductors are in the sheaves and before clipping-in or dead ending is begun.

The total time during which the conductor is allowed to remain in the stringing blocks before being clipped-in shall not exceed 72 hours.

Torque wrenches shall be used to tighten all nuts on clamps. The torque applied shall be in conformance with the recommendation of the manufacturer.

Yoke plates for V-Vee string insulators shall be installed as shown on the drawings and shall hang at 90 degrees to the conductor axis within a tolerance of plus or minus 2.5 cm.

Well-padded pull-lift hooks or other approved methods shall be used for handling conductors during the clipping-in operation.

(11) **Installation of Conductor and OPGW Accessories**

(a) **Splices and Dead Ends**

All splices shall be of the compression type.

All splices shall be made at least 15 meters away from structures and no splices shall be made in dead end spans or spans greater than 600 meters or spans crossing over the highways, railroads, major canals, rivers and transmission lines of voltages greater than 33 kV unless approved by the Engineer.

As a rule not more than one joint or splice should be made in any one conductor in any one span. However, in exceptional cases, as in the repair of damaged conductors, or when necessary owing to stringing limitations two splices will be allowed.

The splices and compression dead ends shall be installed in accordance with the recommendations of the Manufacturer of the accessories.

Conductor shall be laid out straight for a distance of 15 meters and straightened at the end before preparation of the ends for splicing or dead-ending. The ends of the conductor shall be thoroughly cleaned immediately prior to compressing. After the compression has been completed, all corners, sharp projections and indentations shall be carefully rounded and smoothed, and tape, tape residue, and filler paste shall be removed from splice and conductor. If the completed splice requires straightening, it shall be straightened on a wood block by use of a wooden maul.

Splicing, dead-ending and repair of damaged conductor shall be done in the presence of nominated person of the Engineer.

If the completed splice or dead-end is not satisfactory, in the opinion of the Engineer or his nominated person, it shall be removed and a new splice or dead-end shall be properly installed.

The Contractor's inspector shall stamp his own initials on the aluminum sleeve of each compression joint and compression dead end completed under his supervision.

(b) **Repair of Conductors**

Damage is any deformity on the surface of the conductor which can be detected by eye or by feel and shall be repaired by whichever the following methods is appropriate:

(i) Repair by manual polishing
(ii) Installation of repair sleeves over the damaged part
(iii) Installation of compression joints

(iv) Replacement with new conductor

Slight damage such as superficial scratches or abrasions, which are not deeper than one-third the strand diameter, can be repaired by dressing with a fine emery cloth.

Severe cuts which cannot be repaired with emery cloth due to their depth or extension, and cause increase in the resistance of the external layers shall be repaired by use of repair sleeves, provided that not more than one-third of the outer layer is cut or damaged over a length of less than 10 centimeters.

Damages of extent greater than described in above paragraphs shall be repaired by replacing the damaged length of the cable using compression joints.

When there is repeated damage in the same span or in consecutive spans, the Engineer or his nominated person may require all conductors in these spans to be replaced.

In the case when signs of corrosion are detected during the stringing operation, the reels containing corroded conductors shall be set aside, the operation shall be interrupted and the Engineer or his nominated person shall be informed immediately.

Whenever a repair sleeve is installed, a rope cage shall be placed on the sleeve to ensure that there will be no damage from sub-conductor slapping prior to installation of the spacer-dampers.

(c) **Jumper Connections**

Where compression type dead-ends are used, the jumper shall be one continuous piece, and compression-type jumper terminals bolted to the compression-type dead-ends shall be used.

(12) **OPGW Jointing/Splicing and Installation of OPGW Joint Boxes**

OPGW jointing/splicing and joint boxes installation will be carried out by the Contractor. However, following general instructions should be followed:

No mid span joint shall be allowed in the OPGW. All joints shall be performed in a joint box located on the tower just above the location of anti-climbing device. OPGW jointing (splicing) and joint boxes installation including supporting device for joint boxes shall be executed by the Contractor. OPGW shall be dropped to the joint boxes along with tower braces by installing OPGW attaching clamps at about one meter interval.

26 **Installation of Dampers**

(1) **Spacer Dampers**

The four sub-conductors of each phase shall be secured to each other by means of spacer dampers installed strictly in accordance with data furnished.

The intervals, measured along the length of the conductors at which spacers are installed shall be as shown on the data sheets with tolerances not more than plus/minus 1.0 meter.

Spacer-dampers shall be installed in a span only after that span has been dead-ended and clipped-in. The installation of spacer dampers shall be completed in each section within 72 hours after the sub-conductors have been sagged.

The clamps shall be properly aligned on the conductors. Distorted shape of the spacer dampers will be considered an unsatisfactory installation and shall be corrected or the spacer damper replaced.

The bolts of the breakaway type shall be tightened until the outer head breaks off.

Spacer dampers shall be installed with the bolt heads in a downward position for viewing from the ground.

(2) **Vibration Dampers**

Vibration dampers shall be attached to the OPGW at the ends of all spans and as designated on the data sheets. The vibration dampers shall be fastened securely to OPGW so that they will hang in vertical planes. Spacing of dampers shall be in accordance with the Drawings. Breakaway type bolts shall be tightened until the outer head breaks off.

27 PRE COMMISSIONING AND COMMISSIONING TESTS

27.1 Pre Commissioning Tests

Mechanical Tests

For steel structures, ensure that structure type is as per specification/drawings/structure list.
Check galvanizing and thickness (rust is not acceptable).

Check bolt types and tightness (torque wrench method).

Ensure anti-climbing guards are correctly installed.

Check step bolt tightness.

For RTV Coated porcelain insulators, check insulators for chips, cracks, etc. Ensure correct number of insulators have been installed in each string. Ensure that cotter keys have been properly installed.

Make sure that insulators are clean and line is safe to be energized.

Check that all line hardware and fittings (insulators, corona rings, vibration dampers, spacer dampers, conductor clamps, armor rods, etc) is installed correctly and in correct locations as per specifications and drawings.

Check that all splices are correct and installed in correct span locations.

Check that all jumpers are installed correctly. Ensure correct clearances between jumper and structure as well as with other phases at acute angle locations.

Ensure there is no twist in the insulator string.

Check that OPGW is grounded to towers as specified.

Ensure that sags for phase and overhead ground conductors are even and according to the specification.

Check that ground clearances are as per specification.

Check circuit/phase identification plates, structure number plates, danger sign plates, etc. have been correctly installed at each structure and aerial markers at the required structures.

Check line/phase correctly transposed at the specified locations and clearance between the phases is as per specification.

Electrical Tests

Check tower footing resistance as per specification.

Verification of physical phase arrangement.

Perform sequence impedance test (both zero and positive sequence).

Perform continuity and insulation test of complete transmission line with appropriate test equipment.

Tests on OPGW:

OTDR test of each fiber

Attenuation test

Continuity test

27.2 **Commissioning Tests**

Perform phase sequence/rotation check.

Inspection of Facilities for any visual/audible abnormality.

SOP FOR
BLACKLISTING OF CONTRACTORS

NATIONAL TRANSMISSION & DESPATCH CO. LTD

Company Secretary

No. NTDC/CS/ / 191-207 **Dated: 27 - 02- 2019**

NOTIFICATION

Approval for revision of SoP for Blacklisting

Ref: This office notification No.NTDC/CS/1728-42 dated 25.07.2017.

The Board of Directors National Transmission & Despatch Company Limited (NTDC) in its 150th meeting held on 25.02.2019 against agenda item No.10 has unanimously resolved and approved the revised/amended SoP for Blacklisting.

Ijaz Ahmad
Company Secretary

Copy to:

1. Managing Director.
2. Dy. Managing Director (AD&M).
3. Dy. Managing Director (P&E).
4. All General Managers.
5. Chief Financial Officer.
6. Chief Law Officer.
7. Chief Internal Auditor.
8. Chief Information System.

A copy of the revised SoP for Blacklisting is enclosed.

NATIONAL TRANSMISSION & DESPATCH CO. LTD

Company Secretary

No. NTDC/CS/ *444-60*

Dated: *29* - *0 3* - **2019**

CORRIGENDUM

Approval for revision of SoP for Blacklisting

In continuation to this office Notification No.NTDC/CS/191-207 dated 27.02.2019 on the subject matter, the designation of Chief Engineer (Reliability Assessment) being a committee member in Chapter No.3 under Clause 3.1 at page # 7 of the approved revised/amended SoP for Blacklisting may be read as 'Chief Engineer (Reliability Compliance)'.

Note:

- **All other contents of the notification will remain intact.**

liaz Ahm d

a

Company Secretary

Copy to:

1. Managing Director.
2. Dy. Managing Director (AD&M).
3. Dy. Managing Director (P&E).
4. All General Managers.
5. Chief Financial Officer.
6. Chief Law Officer.
7. Chief Internal Auditor.
8. Chief Information System.

NATIONAL TRANSMISSION AND DESPATCH COMPANY LIMITED (NTDC)

REVISED SOP FOR BLACKLISTING

(As on 25.02.2019)

Table of Contents

CHAPTER NO.1

1.1 INTRODUCTION

The main objectives of any procurement process are transparency, economy, fairness and efficiency so that value for money is achieved.

Blacklisting is one of the most effective tools used in the struggle against inefficiencies and corruption in connection with public procurement. In addition, it serves as a major deterrent against any material breach of contract and further ensures the timely execution of projects by holding delinquent persons accountable.

Rule-19 "Blacklisting of suppliers and contractors" of the Public Procurement Rules, 2004 (hereinafter "**PPRA Rules**") stipulates that;

"The procuring agencies shall specify a mechanism and manner to permanently or temporarily bar, from participating in their respective procurement proceedings, suppliers and contractors who either consistently fail to provide satisfactory performances or are found to be indulging in corrupt or fraudulent practices. Such barring action shall be duly publicized and communicated to the Authority:
Provided that any supplier or contractor who is to be blacklisted shall be accorded adequate opportunity of being heard."

In the light of the Clause above, this SOP has been drafted for procurements made by NTDC.

Any capitalised terms and abbreviations used in this SOP which are not defined herein shall have the meanings given to them in Public Procurement Regulatory Authority Ordinance, 2002 (hereinafter "**PPRA Ordinance**") and PPRA Rules.

1.2 EXTENT OF APPLICATION

i. The procedure shall be applicable and remain in force, along with any amendments thereto, within NTDC until any clear instructions or guidelines are imparted by the Government through PPRA, PEC, or any other competent forum.

ii. The procedure shall also be applicable on the pre-qualified firms.

iii. The procedure shall be applicable on any "Person", which for the purposes of this SOP shall *interalia* include suppliers, bidders, contractors, consultants, firms, individuals, and organizations transacting business with NTDC.

iv. Wherever any provision of this SOP shall be in conflict with provisions of any applicable guidelines of donor agencies, or any other applicable Statute / Law or Rule enforced at the time in Pakistan, the provisions of such applicable guidelines, laws, or rules shall prevail.

v. This SOP shall become a part of the future Bidding Documents and the person(s) will submit an Undertaking along-with his bid that he has read and accepts the provisions of this SOP. Non-submission of an Undertaking may result in rejection of his bid. The said Undertaking will subsequently become part of the Contract Agreement as well.

CHAPTER NO. 2

2. REASONS OF BLACKLISTING

2.1 The causes and reasons to be taken into consideration for Debarment / Blacklisting of any person are given as under:

2.1.1 Pre- Award Stage:

The following shall be considered, *interalia*, the causes / reasons for initiating proceedings under this SOP at the Pre-Award Stage:

i. Indulging in Corrupt, Fraudulent as well as Collusive practices.

ii. Submission of false and spurious documents, making false statements, making frivolous complaints and allegations to gain undue advantage.

iii. Commission of embezzlement, criminal breach of trust, theft, cheating, forgery, bribery, falsification or destruction of records, receiving stolen property, false use of trademark, securing fraudulent registration, giving false evidence, furnishing of false information of serious nature.

iv. Submission of false bid security or infringement of documents to get undue monetary or any other benefit.

v. Breach of confidentiality of evaluation process as mentioned in Appendix- 1 based on illegal access or in any way to get undue benefit or to provide benefit or to frustrate the bidding/evaluation process. This will also include attempts to sabotage the bidding process directly or indirectly.

2.1.2 Post- Award Stage:

The following shall be considered, *interalia,* the causes / reasons for initiating proceedings under this SOP at the Post-Award Stage:-

i. Extraordinary delay in signing or refusal to accept the Notification of Award and/or the contract without any cogent reason.

ii. Misconduct, i.e., failure to proceed with the signed contract, withdrawal of commitments, quoting an unreasonably and unfairly low financial offer and subsequently withdrawing such an offer, frustrating the evaluation/bidding process and not responding to written communication in a reasonable time.

iii. Causes mentioned in Clause 2.1.1 (i, ii & iii) above.

iv. Submission of fake / frivolous or mutilated Performance Guarantee or Advance Payment Guarantee etc.

v. Non-satisfactory performance as mentioned in Appendix-2 during the execution of the contract.

vi. Non-performance or Breach of provisions / clauses of the contract agreements.

vii. Notwithstanding the warranty/defect liability period, any defect in a product, equipment, plant, facility or services rendered that may subsequently surface during field operations within 5 years of its commissioning.

viii. Failure to honour obligations within warranty period or defect liability period as defined in the contract.

2.1.3 Other Causes

i. The person is blacklisted by any Government department in Pakistan, or it is established that the firm is involved in any kind of corruption or corrupt practices anywhere in the world.

ii. Violations of provisions / instructions set down in the Bidding Documents.

iii. Any attempt / activity to malign or bring NTDC into disrepute and harm its interest(s).

iv. Person(s) blacklisted by International Financial Institutions (donor agencies) will be liable to be blacklisted after receipt of confirmation from the donor agencies without any further proceeding.

v. Any other cause deemed just and appropriate by NTDC in the given circumstances.

Note:

(1) If above mentioned causes occur either on part of the principal bidder or the local agent, both shall be considered for blacklisting / debarment.

(2) The authorization of the foreign bidder to local agent shall contain his complete particulars including the name of the company, name of the owner, National Tax number (NTN), CNIC (Computerized National Identity Card) No. etc. In case, the said information is found to be missing, even after calling for the same within a reasonable time, the authority letter shall not be accepted.

(3) The Bidding Documents shall be issued against original authority letter or in case of scanned copy, the email of the foreign bidder shall be enclosed. However, at the time of bidding, the original authority letter shall be attached with the bid. In the absence of the same, the bid shall be rejected.

CHAPTER NO. 3

3. FORMULATION OF "NTDC'S RIGHTS PROTECTION COMMITTEE"

3.1 A permanent Committee namely "NTDC's Rights Protection Committee (**RPC or Committee**)" comprising of the following members shall examine the justification of the reasons given by the Project Authority prior to blacklisting / debarment of any firm/supplier/contractor/ individual.

- General Manager (Performance Assessment) NTDC — Convener
- Chief Engineer (Reliability Compliance) NTDC — Member
- Representative of the Chief Law Officer's Office — Member

Depending upon the nature of the case, the Committee may consult or appoint / nominate additional members from within NTDC with the approval of Managing Director (NTDC), provided that the Committee consists of an odd number of individuals as per spirit of Rule 48(1) of the PPRA Rules. Independence of any additional members shall be ensured while making the selection of such additional members. Furthermore, the aforementioned RPC shall also be authorized to seek external expert advice as and when required.

CHAPTER NO. 4

4.1 PROCEDURE FOR BLACKLISTING

Upon receipt of or obtaining information and/or knowledge that any person(s) is involved in practices mentioned in Chapter-2 earlier, the concerned Project Authority / formation shall promptly formulate its recommendations and submit through MD NTDC to NTDC RPC along with its findings, details of charges and documentary evidences to initiate proceedings under this SOP.

4.2 INITIATION OF AN ACTION

(i) Within a period of 15 days after receiving the recommendations of Blacklisting / Debarment from the concerned Project Authority, the Convener of the Committee shall issue a Show Cause Notice ("**Notice**") thereby informing the Person about the alleged charges and shall provide an opportunity to the defend said charges within a time period of 15 (fifteen) days.

(ii) The person(s) shall be accorded adequate opportunity of hearing in order to defend the charges within the given timelines.

(iii) The Notice to the Person shall be sent at the mailing/postal address as provided under the Contract or any other address provided by way of subsequent written communication by the Person The non-receipt of the Notice due to incorrect / change in mailing address without any written communication shall not be attributable to NTDC. In case of non-receipt of any reply from the accused person within the formulated time, but not less than the time given in 4.2 (i) above, the Committee shall have the right to proceed on Ex-parte basis.

4.3 DECISION

i. The committee shall hold an independent inquiry/investigation as the case may be, and, which may include site visits and interviews with the parties concerned. The Committee shall complete the entire inquiry/investigation, preferably within a period of 30 days after receipt of response from the person against whom proceedings under this SOP have been initiated and shall present the report to the MD NTDC.

ii. If required, the Committee may report the case to an appropriate law enforcement agency depending upon the nature of the case for detailed investigations with the prior approval of Managing Director (NTDC).

iii. The person against whom proceedings have been initiated under this SOP shall not proceed for arbitration/litigation during the proceedings for blacklisting.

4.4 COMMUNICATION OF DECISION

After recommendation for blacklisting by "NTDC's Rights Protection Committee **(RPC)**", the person concerned shall be informed within 10 days of such decision. The decision of the Committee will be notified on NTDC's and PPRA's websites and shall also be conveyed to Pakistan Engineering Council. Blacklisting of firms shall also be conveyed by circular to other Government Departments. All other relevant procuring agencies including PEPCO, DISCOs, and WAPDA, etc., will also be informed simultaneously.

4.5 PERIOD OF DEBARMENT FOR BLACKLISTED FIRMS

(i) The Blacklisting on the grounds and reasons specified herein above in Chapter No.

2 shall be for a reasonable specified period of time and as a general rule of prudence, the period may not exceed three years, except in cases where debarment/blacklisting has been done by any other government department or an International Financial Institution (Donor Agency).

(ii) In case the person has been blacklisted by the government department or the International Financial Institution (donor agency), the period of blacklisting/debarment shall be for a maximum period of 3 years or the time period for which the concerned government department/International Financial Institution (Donor Agency) debarred the contractor (whichever is higher).

4.6 ACTION AFTER PERSONS A REPLACED ON BLACKLISTING LIST.

i. The decision of blacklisting will be immediately circulated to all concerned as mentioned at Clause 4.4 above.

ii. In case of a contract already awarded to a person which has been blacklisted and termination is either not possible or not feasible, the concerned Project Authority may proceed in this case to complete the contract with the approval of Competent Authority.

iii. The blacklisted person shall stand disqualified from bidding from the date of decision against them. Any pending bids shall also stand rejected. If a contract has already been awarded to person, it shall be voidable at the option of NTDC as per 4.6 (ii) above.

iv. A separate register or data base will be maintained for blacklisted firms indicating reasons and period.

4.7 EFFECTIVENESS

These guidelines / SOP or any amendments thereof shall take effect immediately after its approval from Board of Directors of NTDC.

APPENDIX-1

PROCESS TO DEAL WITH FRIVOLOUS COMPLAINTS

It has been frequently observed that after opening of tenders, the bidders start to influence the evaluation process. Such attempts result in delay in finalizing of award of contract and cause financial loss to the National exchequer. The evaluation process is confidential till publication of award of contract process.

Provision of guidelines of international donor agencies and PPRA provides sufficient opportunity to bidders for redressal of their grievances. Hence, the attempts made by the bidders during evaluation process or thereafter to influence the contract award decisions fall under the definition of corrupt and fraudulent practices. Therefore, during bidding stage, the following mechanism shall be adopted in case of receipt of any frivolous complaint from the bidder.

i. Anonymous complaints shall not be entertained.

ii. The Procuring Agency reserves the right to call for an affidavit from the complainant verifying the truthfulness and correctness of the contents of the complaint.

iii. The notice of displeasure and explanation will be immediately sent to those persons who lodge frivolous complaint(s) during the evaluation process.

iii (a) If the person itself or through its agent or any third party does not refrain from making frivolous complaints in the same tender or any other tender, an official warning will be sent and their case may be sent to "NTDC's Rights Protection Committee" which may analyse the situation and suggest action including the rejection of the bid of the complainant. However, Project Authority may reject the bid even in first instance depending upon nature of the case or provision of the Bidding Documents.

iii (b) If the same person itself or through its agent or any third party lodges a frivolous complaint in another tender floating in parallel before decision of the Grievance Committee, its bid will straight forwardly be rejected by the project authority. It may also be debarred to participate in the next tender for a minimum period of six months under intimation to the Grievance Committee and MD NTDC.

iv. In order to monitor the record of the persons, a data base will be maintained at NTDC's website and the offices of the project authorities regarding such persons who consistently lodge frivolous complaints during the evaluation process by making clandestine access to confidential record and hamper the award of contract process.

NOTE: It is clarified that the process provided above in Appendix 1 is to discourage anonymous and frivolous complaints only, and does not bar any person feeling aggrieved by any act of the procuring agency from lodging a genuine complaint/grievance as provided under Rule 48 of the PPRA Rules, 2004.

APPENDIX-2

GUIDELINES FOR EVALUATION OF PERFORMANCE OF CONTRACTORS

i. After signing of the contract, the Project authority (or the Consultant / Engineer) must monitor and evaluate the Contractor's performance, that is, whether the Contractor is fulfilling his obligations based on the terms of the contract and plans that were developed and agreed upon with the Project authority at the time of signing of contract or during kick-off meetings.

ii. Though the performance evaluation of any person is an on-going process, which takes place throughout the duration of the contract and also during the Defect Liability / Warranty Period, nevertheless, a person's Performance Evaluation Report may be prepared for the consumption and benefit of the procuring agency or for any other purpose at the completion of the project, as the case may be.

iii. The performance evaluation report shall be prepared for all contracts of more than Rs. 100 million. When based on the Evaluation Report, the performance of a person is non-satisfactory, the procuring agency may initiate the case for blacklisting of the person in accordance with the terms of this SOP. For the avoidance of doubt, consistent failure to provide satisfactory performance shall also include performances in a single or multiple contracts executed or being executed by the same person, as the case may be.

iv. In case of any extra-ordinary delay in performance of a single contract of vital and critical importance, the procuring agency shall have the right to initiate proceedings under this SOP and/or avail any other remedy provided under the law which may *interalia* include: termination of the contract, recovery of losses, debarring the person from participation in future tenders. The procuring agency shall be the sole judge to determine the projects of vital or critical importance.

v. In case of ordinary delay in performance in 2 consecutive contracts within a period of 3 years, the procuring agency shall have the right to initiate proceedings under this SOP and/or avail any other remedy provided under the law which may *interalia* include: termination of the contract, recovery of losses, debarring the person from participation in future tenders.

vi. The proceedings under this SOP shall not prejudice any other rights and/or remedies available to the procuring agency under the contrre3act documents and/or any other law in force.