

NATIONAL GRID COMPANY OF PAKISTAN
(Formerly NTDC)



BIDDING DOCUMENT NO. PD-EHV-II-NGC-MN-02-
(2026-2027)

RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV
TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV
GRID STATION JAMSHORO INCLUDING CIVIL WORKS,
DIMANTLING, TRANSPORTATION, ERECTION, STRINGING,
TESTING AND COMMISSIONING

Single Stage-Single Envelope (SSSE)

August, 2026

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PROJECT DIRECTOR (EHV-II)
NGC MULTAN

Invitation for Bids (IFB)

INVITATION FOR BID

Date: 31.08.2026

TENDER NO. PD-EHV-II-NGC-MN-02-2026-27

- 1- National Grid Company of Pakistan (NGCP) "the Employer", intends to get the Works done for (Tender No. PD-EHV-II-NGC-MN-02-2026-27). The Scope of works includes the following:

RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV GRID STATION JAMSHORO INCLUDING CIVIL WORKS, DIMANTILING, TRANSPORTATION, ERECTION, STRINGING, TESTING AND COMMISSIONING.

- 2- The Employer invites bids electronically through EPADS 2.0 under Single Stage Single Envelope (SSSE) procedure on National Competitive Bidding (NCB) basis from eligible firms as defined under Instructions to Bidders of the Bidding Documents, registered with Income Tax and 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 NGCP specifications (details, types and quantities mentioned in the bidding document). *The bidder as single entity or approved sub-contractor should have executed conventional as well as pile foundations, erected towers and carried out stringing work successfully tested and commissioned at least 01 No. of similar works of 220kV or higher voltage level during last ten years.*
- 3- The complete set of bidding documents containing all terms & Conditions etc. are available at EPADS 2.0. The advertisement is also available at ppra.org.pk & ntdc.com.pk websites.
- 4- All bids must be accompanied by a Bid Security in the amount not less than 2% of total bid price in Pak. Rupees in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan in favor of the Employer valid for a period up to Twenty-Eight (28) days beyond the bid validity date which must also be submitted in original and hard form before opening of bids at following address.
Office of PROJECT DIRECTOR (EHV-II) NGC MULTAN
House No. 86, Block-L, Shah Rukn-e-Alam Colony, Multan
- 5- The bids prepared in accordance with instructions in the bidding documents must be submitted on EPADS on or **before 24.09.2026 before 1100 HRS** and Bids will be opened at **1130 HRS** on the same day, in presence of Bidders Representatives who choose to attend at the same address.
- 6- NGCP reserves its rights regarding rejection of bids as defined in clause 33 of PPRA Rules 2004.


PROJECT DIRECTOR
(EHV-II) NGC, MULTAN

BIDDING DOCUMENT NO. PD-EHV-II-NGC-MN-02-(2026-2027)

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Instructions to Bidders

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 and the Bidding Data.

IB.2 Source of Funds

- 2.1 The Employer has arranged the funds under own resources in local currency towards the cost of the project and it is intended that this 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.

IB.4 One Bid per Bidder

- 4.1 Each bidder shall submit only one bid by himself. 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 respective 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. Form of Bid & Appendices to Bid.

4. Bill of Quantities.
5. Form of Bid Security.
6. Form of Contract Agreement.
7. Forms of Performance Security and Mobilization Advance Guarantee/Bond.
8. General Conditions of Contract, Part-I (GCC).
9. Particular Conditions of Contract, Part-II (PCC).
10. Specifications – Special Provisions.

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 07 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 would include the following:
 - (i) Evidence of access to financial resources alongwith average annual construction turnover;
 - (ii) Work commitments

- (iii) Current litigation information; and
- (iv) Availability of necessary equipment.

and

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

Appendix-D to Bid	Proposed Construction Schedule
Appendix-E to Bid	Method of Performing the Work
Appendix-F to Bid	List of Major Equipment
Appendix-J to Bid	Organization Chart for Supervisory Staff
and other pertinent information such as mobilization program etc.;	

- 11.2 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.
- 12.3 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 the deadline for submission of bids shall be included in the rates and prices and the total Bid Price submitted by a bidder. Additional / reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed / deducted as per Sub-Clause 70.2 of the General Conditions of Contract Part-I.

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.

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, are 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 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.

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 initialled 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 or withdraw 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 fifteen (15) 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.
- 29.3 Provided that such qualification shall only be laid down after recording reasons thereof 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 14 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-L 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 Document.

Section II
Bid Data Sheet (BDS)

NITBID DATA SHEET

The following specific data for the Works to be bidden 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 Transmission and Despatch Company (NTDC). Address: PROJECT DIRECTOR (EHV-II) NGC, MULTAN Bungalow #86, Block-L, Shah Rukn-e-Alam Colony, Multan
IB 1.1	Brief Description of Works The Scope of works includes: RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV GRID STATION JAMSHORO INCLUDING CIVIL WORKS, DIMANTLING, TRANSPORTATION, ERECTION, STRINGING, TESTING AND COMMISSIONING
IB 1.2	Time for completion is 30-days from the date of commencement of the project or the approval of final shutdown from NPCC, whichever is later.
IB 2.1	Source of Funding: NGC Own Resources
IB 3.1 (b)	1. Firms registered with Income Tax and 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 NGCP specifications or has applied for renewal of PEC registration before date of submission of bids. 2. The bidder as single entity or approved sub-contractor should have executed conventional as well as pile foundations, erected towers and carried out stringing work successfully tested and commissioned at least 01 No. of similar works of 220kV or higher voltage level during last ten years.
	1. <u>Financial Qualification.</u> i. The bidder shall submit audited financial statements (Balance Sheet and Profit & Loss A/C) for the last two (2) years, showing a positive Net Worth (total assets minus total liabilities). <i>(QF-5, Section III)</i> ii. The bidder's profit and loss account should show a minimum average annual turnover for the last two years equal to the Bid value. <i>(QF-6, Section III)</i> iii. The bidder shall demonstrate access to or availability of financial resources (liquid assets, lines of credit, or other financial means, excluding advance payments) sufficient to meet a minimum cash-flow requirement equal to 40% of the Bid value. <i>(QF-7, Section III)</i>

	2. The above stated requirements are a 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.																					
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. All cost in this respect shall be at the bidder's own expense.																					
IB 7.2	The Bidders should ensure that they have received the complete set of the bidding Documents. Every bid is deemed to be made on the basis of all of the bidding Documents, including any Addenda. The Employer accepts no responsibility for any Bidder lacking a complete set of Bidding Documents or any other information.																					
IB 8.1	The details presented in the bidding Documents have been compiled with all reasonable care, however, it is the responsibility of the bidder to satisfy himself that the information given in each section is adequate and that there is no conflict between various clauses/sections/ Specifications. In case of any variation, the same may be referred to the Employer for clarification/ decision before at least 07 days prior to due date of submission of Bid. The clarification/ decision of the Employer shall be final and conclusive. 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 prepared in Single envelope, comprising the following documents: I. Complete Single Stage Single Envelope Bid a) Duly filled-in Form of Bid with following Appendices to Bid: <table><tr><td>i)</td><td>Appendix-A to Bid</td><td>Special Stipulations</td></tr><tr><td>ii)</td><td>Appendix-B to Bid</td><td>Bill of Quantities</td></tr><tr><td>iii)</td><td>Appendix-C to Bid</td><td>Proposed Personnel</td></tr><tr><td>iv)</td><td>Appendix-D to Bid</td><td>Proposed Construction Schedule</td></tr><tr><td>v)</td><td>Appendix-E to Bid</td><td>Method of Performing the Work</td></tr><tr><td>vi)</td><td>Appendix-F to Bid</td><td>List of Major Equipment-Related Items</td></tr><tr><td>vii)</td><td>Appendix-G to Bid</td><td>Construction Camp and Housing Facilities</td></tr></table>	i)	Appendix-A to Bid	Special Stipulations	ii)	Appendix-B to Bid	Bill of Quantities	iii)	Appendix-C to Bid	Proposed Personnel	iv)	Appendix-D to Bid	Proposed Construction Schedule	v)	Appendix-E to Bid	Method of Performing the Work	vi)	Appendix-F to Bid	List of Major Equipment-Related Items	vii)	Appendix-G to Bid	Construction Camp and Housing Facilities
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vii)	Appendix-G to Bid	Construction Camp and Housing Facilities																				

	viii) Appendix-H to Bid List of Sub-Contractors ix) Appendix-I to Bid Deviations x) Appendix-J to Bid Organizational Chart of the Supervisory Staff and Labor xi) Appendix-K to Bid Bidder's Qualification Forms xii) Appendix-L to Bid Integrity Pact xiii) Appendix-M to Bid Undertaking of Bid Security b) Proof of purchase of Bidding Documents from the Employer; c) Undertaking by the Bidder in respect of submission of required Bid Security as per Appendix-M to Bid; d) PEC license pursuant to Sub-Clause 3.1(i); and e) Any other document required to be submitted in accordance with these Bidding Documents. f) Duly filled-in Form of Price Bid g) Bid Security; and Any other document required to be submitted in accordance with these Bidding Documents.
IB 11.1(b)	To be qualified for award, Bidders shall provide satisfactory evidence to the Employer of their capability and adequacy of resources to carry out the contract effectively.
IB 11.1 (c)	The bidder must demonstrate that it has the personnel for the key positions that meet the following requirements: • Electrical & Civil Engineers 05 years of work experience
IB 12.2	These price schedules forms must be completed without any alterations to its format and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
IB 14.1	The period for validation of Bid will be minimum 120 days after the date of bid opening. A bid valid for short period will be rejected as non-responsive.
IB 15.1	All bids must be accompanied by a Bid Security of at least 2% of the contract price.
IB 15.2	The bid security shall be drawn in the favor of PROJECT DIRECTOR (EHV-II) NGC, MULTAN.
IB 17.1	No pre-bid meeting will take place.
IB 18.4	Bids will be submitted on EPADS only
IB 19.2 (a)	Employer's address for the purpose of Bid submission: PROJECT DIRECTOR (EHV-II) NGC, MULTAN Bungalow #86, Block-L, Shah Rukn-e-Alam Colony, Multan

IB 19.2 (b)	Brief Description of Works RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV GRID STATION JAMSHORO INCLUDING CIVIL WORKS, DIMANTLING, TRANSPORTATION, ERECTION, STRINGING, TESTING AND COMMISSIONING Identification No.: <u>TENDER NO. PD-EHV-II-NGC-MN-02-(2026-2027)</u>
IB 20.1 (a)	Deadline for Submission of bid: Date: 24-09-2026 Time: 11:00 HRS.
IB 20.1 (c)	The delivery of the bid shall be made electronically through EPADS (E-Pak Acquisition and Disposal System).
IB 23.1 (a)	The Employer shall open the Bids on EPADS, 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. Venue: Office of the PROJECT DIRECTOR (EHV-II) NGC, MULTAN Bungalow #86, Block-L, Shah Rukn-e-Alam Colony, Multan. Date: 24-09-2026 Time: 11:30 HRS
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 anytime reject any Bid by that Bidder without further consideration.
IB 25.1	i. The Employer's request for such clarifications, additional information or modifications may be made for information that has been partially or completely omitted from a 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. ii. The Employer may consider and take into account any and all additional information or clarification provided by a Bidder in response to such requests in the same manner and to the same extent as if that information or clarification was part of such Bidder's original Bid. However, the Employer will not consider any information provided after the Closing Time that is not in response to a request.
IB 26.1	i. The Employer may refuse to consider, remove from the evaluation process entirely and to reject out right any Bid that the Employer determines is materially incomplete, obscure or irregular, that contains exceptions or variations not acceptable to the Employer or that omits any material information required to be submitted by the bidding Documents. ii. The evaluation of various experience criteria shall be done on the basis of certificates (issued by Order Placing Authority clearly indicating the date of issue) submitted by the bidder for which responsibility to furnish necessary documentary proof rests on participating Bidder.
IB 26.2	The Employer reserves the right to waive deviations if they do not materially affect the capability of the bidder to perform the contract.

IB 26.3	If a Bid in the Employer's opinion is materially incomplete, obscure or irregular, contains exceptions or variations not acceptable to Employer or omits any material information required to be submitted by the bidding Documents, then the Employer (taking into account the number of compliant Bids that were actually received) may waive such non-conformance with the requirements of this Bidding Documents on such terms and conditions as the Employer may consider appropriate, even if any such non-conformance or failure to comply with the requirements of this Bidding Documents would otherwise render such Bid null and void. The decision of the Employer in this matter shall be final and binding on the bidders.
IB 28.1	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. The quality of a bidder's performance on previous contracts with Employer or others; ii. Anticipated or ongoing claims with or in connection with a bidder;
	iii. Any security or safety concerns which Employer may have in respect of a bidder or its facilities, subcontractors or suppliers; iv. The results of any interview with a bidder or supplied references: or v. 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 28.4	The amount of the increased performance security shall be decided at the sole discretion of the Employer, which shall be final, binding and conclusive on the bidder. If the price analysis is found unsatisfactory then the Employer may reject such bid.
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. Bid is not received by the due date and time specified. ii. Cost of the bidding documents is not remitted. iii. Bid is not accompanied by Bid security as specified in the document; Bid security is inadequate; Bid guarantee is not in the specified format. iv. Bid does not cover the complete scope of work. v. Bidder does not respond promptly and thoroughly to the request for supplementary information required for the evaluation of his Bid. vi. Bid does not meet minimum acceptable standards of completeness, consistency and detail. vii. Bidder does not meet the minimum acceptable experience criteria. viii. Bid received from any Black listed Firm / Contractor. If 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.
IB 31.2	Except the matter covered by IB 12.1 & IB 28.4.
IB 32.1	Standard form and amount of Performance Security acceptable to the Employer:

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. **PD-EHV-II-NGC-MN-02-(2026-2027)** (the "tender"), including signing and submission of all documents and providing information / responses to NATIONAL GRID COMPANY OF PAKISTAN,NGCP 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 _____ 2020 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

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 andby..... 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 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 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 design, manufacture, Supply of Equipment Materials stipulated in the bidding documents 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 andby..... 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 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 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 design, manufacture, Supply of Equipment Materials stipulated in the bidding documents 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 of the authorized
representative)

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.-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.
.....

(Signature of the authorized
representative)

Name

Designation

Signature

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).

BILL OF QUANTITIES

NATIONAL GRID COMPANY OF PAKISTAN (FORMERLY NTDC)

PD-EHV-II-NGC-MN-02-2026-27

RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV GRID STATION JAMSHORO INCLUDING CIVIL WORKS, DIMANTLING, TRANSPORTATION, ERECTION, STRINGING, TESTING AND COMMISSIONING

A. Civil Works

Sr. No.	Descriptions of Item	NO			Length	Width	Height	Qty	Unit	Unit Rate (PKR)	Amount (PKR)
1	Dismantling of SP-BH Chimney Pole Foundation cement concrete reinforced separating reinforcement from concrete cleaning and straightening the same.	1	X	1	4.520	4.520	0.500	46.17	Cum		
	Total Dismantling							46.17	Cum		
2	Excavation in foundation of buildings, bridges and other structures including dibbling dressing, refilling around structure with excavated earth, watering and ramming lead upto 30 m and lift upto 1.5 m (in hard soil or soft soil) Cutting hard rock.	1	X	1	4.520	4.520	0.500	10.22	Cum		
	Total Excavation							10.22	Cum		

3	Reinforced cement concrete work using coarse sand except the cost of steel reinforcement and its labour for bending and binding. This rate also includes all kinds of forms moulds: lifting shuttering curing rendering and finishing the exposed surface (including screeing and washing of shingle). a) In- situ in roof slabs beams columns rafts lintels and other structural members complete in all respect CSR Ratio:1:1.5:3										
	Tower Cap (Rectangular Block)	1	x	1	4.520	4.520	1.500	30.65	cum		
	Chimney	1	X	1	3.140	2.400	5.000	37.68	cum		
	Total RCC (1:1.5:3)							68.33	Cum		
4	Supplying and fabrication of Intermediate grade deformed reinforcement for R.C.C. in slabs, beams, columns and pile caps, including cutting, bending laying in position including cost of binding wire.(60,000 psi).										
	Cap Reinforcement #8	2	X	35	7.07		3.973	1966.2	Kg		
	Chimney Dowel #11	1	X	80	6.850		7.907	4333.0	Kg		
	Chimney Spiral #4	1	X	1	120.39		0.994	119.7	Kg		
	Total Reinforcement (kg)							6418.9	Kg		

5	Providing and applying epoxy agent (Sik) or equivalent by clearing and chipping of old surface complete in all respect	1	x	1	4.52		4.52	20.4	Sqm		
										Total:	
										Add 15% SST:	
										Grand Total (A):	

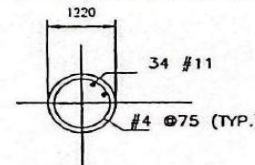
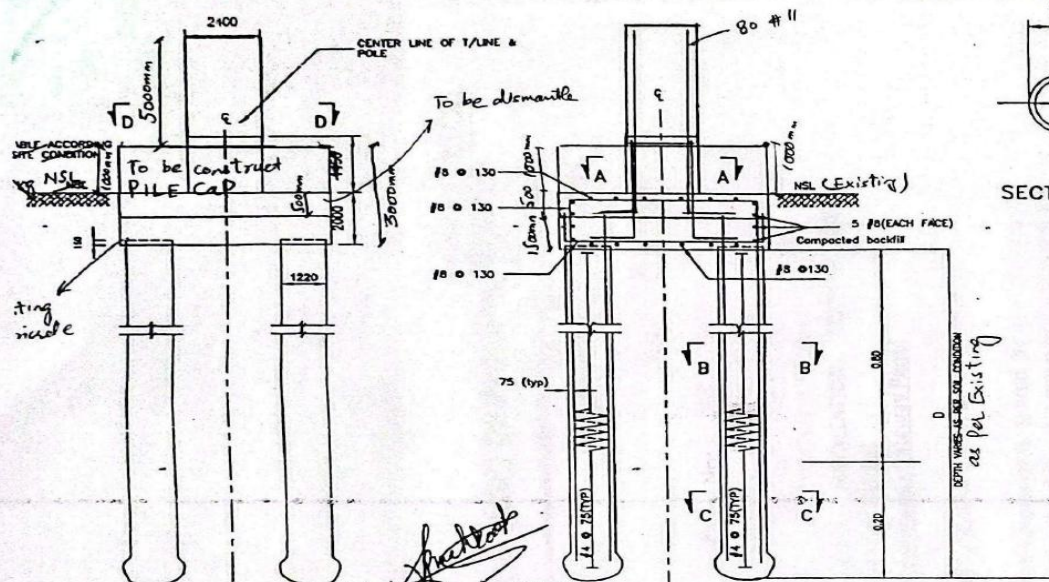
B. Electrical Works

<u>Sr. #</u>	<u>Description</u>	<u>Unit</u>	<u>Qty</u>	<u>Rate</u>	<u>Amount</u>
1.	<u>Mobilization and De-Mobilization of Crews</u>				
a.	Mobilization and De-Mobilization charges of different crews along with requisite T&P etc.	Job	1		
2.	<u>Transportation of Material</u>				
a.	Shifting of Material including AAAC Greely conductor, OPGW and Transmission Line hardware from different nominated NGC Warehouses and stores to site of work including stacking and further shifting of dismantled material to designated NGC Warehouses/stores.	Lumpsum	1		

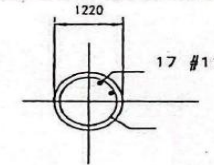
3.	<u>Dismantling of Existing 220kV Pole</u>				
a.	Dismantling of Existing AAAC Greely conductor and OPGW from Terminal Pole to Gantry complete in all respect as per requirement.	Job	1		
b.	Dismantling of Existing "SP-BH" Type Pole complete including insulators, hardware, assemblies complete in all aspects.	Nos.	1		
4.	<u>Erection of Existing 220kV Pole</u>				
a.	Installation of 220KV Double Circuit SP-BH Pole in accordance with specifications and drawings complete in all respect alongwith accessories including U-Bolts/V Shackles, Number plates. Danger signs, phase plates & Anti-climbing device alongwith barbed wire etc.	Nos.	1		
5.	<u>Stringing of Conductor & OPGW</u>				
a.	Installation of AAAC Greely conductor for single conductor per phase configuration (Double Circuit T/L, Terminal Pole to Gantry Span) alongwith allied hardware material including installation of insulators hardware assemblies, stock bridge dampers, jumpers midspan joints deadend clamps, repair sleeves etc. complete in all respects as per specifications & approved drawings.	Job	1		

b.	Installation of OPGW including installation of drop down lengths for joint boxes at the tower alongwith allied hardware material assemblies joints boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings.	Job	1		
6.	<u>Testing and Commissioning of T/Line</u>				
a.	Testing and Commissioning of Transmission Line including Splicing and Testing of OPGW etc.	Lot	1		
	Total:-				
	Add 15% SST:				
	Grand Total (B):				
	Grand Total (A+B) Including Taxes				

Signature: _____
With Stamp of Bidder



SECTION B-B



SECTION C-C

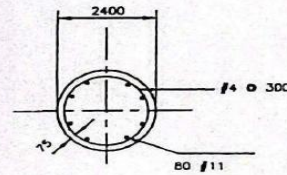
NOTES:

- 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).
- 3- MAXIMUM SIZE OF COARSE AGGREGATE SHALL NOT EXCEED 20mm FOR PILE & 40mm (1.5") FOR PILE CAP.
- 4- ALL MAIN REINFORCING BARS SHALL BE DEFORMED ROUND BARS CONFORMING TO ASTM DESIGNATION A615, GRADE 60 (fy=60,000PSI, 4200kg/sq.cm).
- 5- SPIRAL REINFORCING BARS SHALL BE DEFORMED ROUND BARS CONFORMING TO ASTM DESIGNATION A615, GRADE 40 (fy=40,000PSI, 2812kg/sq.cm).
- 6- CONCRETE SLUMP SHALL NOT EXCEED 75mm. FOR PILE CAP & 150mm FOR PILE.
- 7- REINFORCED CONCRETE CONSTRUCTION TOLERANCES SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
- 8- DRILLING SHALL BE MADE TO THE LINES AND GRADE AS SHOWN OR AS APPROVED BY THE ENGINEER.
- 9- BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.
- 10- PORTLAND CEMENT CONFORMING TO ASTM DESIGNATION C-150 TYPE-1 SHALL BE USED FOR ALL FOUNDATIONS EXCEPT WHERE OTHERWISE REQUIRED TYPE-V SHALL BE USED.

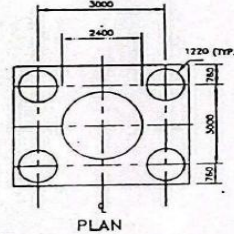
Assistant Manager (Civil)
O/o CE (Civil), NGC

SECTION D-D

Drawing issued in conjunction with this office letter No. **CECCivil)/NGC/MDCL/237/B-03/3041-45** dated **18-05-2026**



SECTION A-A



PLAN

Note:-

- Existing Pile cap will be dismantle to a depth of 500mm
- Rough the Pile cap surface & have the amplitude of 6mm and bonding agent to be applied.
- New Pedestal Reinforcement will be overlap with the existing pedestal vertical bars as shown in drawing.
- For New Pedestal and Pile cap, existing reinforcement of pedestal and pile cap will be used as show in drawing

NATIONAL TRANSMISSION AND DESPATCH COMPANY NTDC (WAPDA)			
DADU-KHUZDAR TRANSMISSION SYSTEM PROJECT			
PACKAGE-1			
220KV DADU-KHUZDAR DOUBLE CIRCUIT TRANSMISSION LINE			
PILE FOUNDATION FOR 'SP-BH' TYPE POLE			
NESPAC + BARQAAB			
JOINT VENTURES			
DESIGN	RECOMMENDED	CHKD.	APPROVED
OWN	CHKD.	CHKD.	CHKD.
FILE	DATE	DRAWING NO.	REV
SUBV.	JAN 2007	2878/169/TD/1E219	

Form of Bid

Bid Reference No. TENDER NO. PD-EHV-II-NGC-MN-02-(2026-2027)

NAME OF PROJECT:

RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV GRID STATION JAMSHORO INCLUDING CIVIL WORKS, DIMANTLING, TRANSPORTATION, ERECTION, STRINGING, TESTING AND COMMISSIONING

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (IB);
- (b) The total price of our Bid, excluding any discounts offered including Addenda thereto for the Total Bid Price of Rupees (_____) or
such other sum as may be ascertained in accordance with the said Documents.
- (c) The discounts offered and the methodology for their application is:
- (d) Our Bid shall be valid for a period of **120** 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; As security for due performance of the under takings and obligations of our bid, we submit here with a Bid security, in the amount specified in Bidding Data Sheet, which is valid (at least) 28 days beyond validity of Bid itself.
- (e) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
- (f) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed and we do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other bidder for the Works.
- (g) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (h) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.
- (i) If awarded the contract, the person named below shall act as Contractor's Representative.
- (j) 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.

Name.....

In the capacity of.....

Signed.....

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

Date.....

Address.....

Email.....

SPECIAL STIPULATIONS**Clause****Conditions of Contract**

1.	Engineer's Authority to issue Variation in emergency	2.1	2% of the Contract Price stated in the Letter of Acceptance.
2.	Amount of Performance Security	10.1	10% of Contract Price stated in the Letter of Acceptance.
3.	Time for Furnishing Program	14.1	Within 02 days from the date of receipt of Letter of Acceptance.
4.	Time for Commencement	41.1	From the date of issuance of NOA.
5.	Time for Completion	43.1, 48.2	30-days from the date of Commencement of the Project subject to availability of shutdowns.
6.	a) Amount of Liquidated Damages	47.1	0.05% 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
7.	Defects Liability Period	49.1	06-Months from the effective date of Completion Certificate.
8.	Percentage of Retention Money	60.2	10 % of the amount of Interim Payment Certificate.
09.	Time of Payment from delivery of Engineer's Interim Payment Certificate to the Employer.	60.10	45 days

B to Bid

BILL OF QUANTITIES

(PREAMBLE)

General

1. The Bill 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 Bill 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 Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract.
4. The rates and prices entered in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract include all costs of Contractor's plant, labour, 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 Bill 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 Bill of Quantities.
6. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill 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 summarised in the Bill of Quantities. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the priced Bill of Quantities.
8. Provisional sums if included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clause 58.2 of Part I, General 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).

The following abbreviations shall be used in the Price Schedules:

Abbreviation

Pakistani Rupees	PKR
Number	No.
Kilometre	km
Kilogram	kg
Linear Meter	Lin.mtr
Percent	%

Quantity

Qty

Pricing

10. Prices shall be filled in indelible ink, and any alterations necessary due to errors, etc., shall be initialed by the Bidder.
11. Bid prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Bidders, in the Bidding Documents. 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.
12. Payments will be made to the Contractor in the currency indicated under each respective item.
13. 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.
14. 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.
15. 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.

Appendix-

C to Bid

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*

PROPOSED CONSTRUCTION SCHEDULE

The Works shall be completed on or before the date stated in Appendix-A to Bid. The Bidder shall provide as Appendix-C to Bid, the Construction Schedule in the bar chart showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the Works and parts of the Works may meet Employer's completion targets in days noted below and counted from the date of signing of Contract Agreement. (Attach sheets as required for the specified form of Construction Schedule):

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

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.

CONSTRUCTION CAMP AND HOUSING FACILITIES

NOT APPLICABLE

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:

1. 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.).

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)	Sub Contractor (With Complete Address)
1	2

DEVIATIONS

NOT APPLICABLE

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.

ORGANIZATION CHART

**FOR THE
SUPERVISORY STAFF AND LABOUR**

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 is 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.	Since:
	2.	Since:
	3.	Since:
	4.	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

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

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

S.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 Phone No. and
Fax of issuing authority

Note: 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.

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 (in)	Value of balance work
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 2 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 is 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.

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, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract.

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.

Form QF-9: Pending Litigation

Each Bidder 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:

(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 times 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:

Signature:

[Seal]

Name of Seller/Supplier:

Signature:

[Seal]

**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:

BID SECURITY (Bank Guarantee)

Security Executed on _____
(Date)

Name of Surety (Bank) with Address: _____
(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address _____

Penal Sum of Security Rupees. _____ (Rs. _____)

Bid Reference No. _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto

(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 Bidder has submitted the accompanying Bid dated _____ for Bid No. _____ for _____ (Particulars of Bid) to the said Employer; and

WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the Employer, conditioned as under:

- (1) that the Bid Security shall remain in force up to and including the date 28 days after the deadline for validity of bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived;
- (2) that the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and
- (3) that in the event of failure of the successful Bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to Clause 15.6 of the Instruction to Bidders for the successful Bidder's failure to perform.

NOW THEREFORE, if the successful Bidder shall, within the period specified thereof, on the prescribed form presented to him for signature enter into a formal Contract with the said Employer in accordance with his Bid as accepted and furnish within fourteen(14) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Surety shall forthwith pay the Employer the said sum 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 Surety at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the principal (Bidder) 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 Surety shall pay without objection the said sum upon demand from the Employer forthwith and without any reference to the principal (Bidder) or any other person.

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

SURETY (Bank)

WITNESS:

Signature _____

1. _____

Name _____

Title _____

Corporate Secretary (Seal)

Corporate Guarantor (Seal)

2. _____

Name, Title & Address

**FORM OF PERFORMANCE SECURITY
(Bank Guarantee)**

Guarantee No. _____

Executed on _____

Expiry date _____

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with address: _____

(Scheduled Bank in Pakistan)

Name of Principal (Contractor) with address: _____

Penal Sum of Security (express in words and figures) _____

Letter of Acceptance No. _____ Dated _____

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

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

_____ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 49, Defects Liability, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, _____ (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Employer's designated Bank & Account Number.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

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

Guarantor (Bank)

Witness:

1. _____

Signature _____

Name _____

Corporate Secretary (Seal)

Title _____

2. _____

Name, Title & Address

Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day of _____ (month) 20____ between _____ (hereafter called the "Employer") of the one part and _____ (hereafter called the "Contractor") of the other part.

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

NOW this Agreement 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 Contract Agreement;
 - (b) The Letter of Acceptance;
 - (c) The completed Form of Bid;
 - (d) Special Stipulations (Appendix-A to Bid);
 - (e) The Particular Conditions of Contract;
 - (f) The General Conditions;
 - (g) The priced Bill of Quantities;
 - (h) The completed Appendices to Bid;
 - (i) The Specifications.
 - (j) _____ (any other)
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this 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 Employer

(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

(Name, Title and Address)

Witness:

(Name, Title and Address)

MOBILIZATION ADVANCE GUARANTEE/BOND

Guarantee No. _____ Date _____

WHEREAS _____(hereinafter called the 'Employer') has entered into a Contract for

(Particulars of Contract)

with _____ (hereinafter called the "Contractor").

AND WHEREAS, the Employer has agreed to advance to the Contractor, at the Contractor's request, an amount of Rupees _____ (Rs _____) which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS, the Employer has asked the Contractor to furnish Guarantee to secure the mobilization advance for the performance of his obligations under the said Contract.

AND WHEREAS, _____
(Scheduled Bank in Pakistan or Insurance Company acceptable to the Employer)
(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 fulfilment 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, 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 remain in force until the advance is fully adjusted against payments from the Interim Payment Certificates of the Contractor or until _____ whichever is earlier.

The Guarantor's liability under this Guarantee shall not in any case exceed the sum of Rupees _____ (Rs _____).

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

GUARANTOR

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

WITNESS

1. _____
Corporate Secretary (Seal)

2. _____
(Name Title & Address)

Corporate Guarantor (Seal)

Section IV

General Conditions of Contract (GCC)

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 – Particular 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

PART-I & PART-II CONDITIONS OF CONTRACT FOR WORKS TO BE ARRANGED BY THE BIDDERS (FIDIC CONCDITIONS) ENGINEERING CONSTRUCTION

FOURTH EDITION 1987

Reprinted 1988 with editorial amendments

Reprinted 1992 with editorial amendments

Section V
Special Conditions of Contract (SCC)

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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 Transmission and Despatch Company (NTDC)
Project Director (EHV-II) NTDC, Multan.
- (a) (iv) The Engineer is: Executive Engineer-II, (EHV-II) Construction Division NTDC Multan.

Or

Any person nominated by the Employer

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.

The following paragraph is added:

- (a)(vi) “Bidder or Tenderer” means any person or persons, company, corporation, firm 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”.

The following paragraph is added:

- (b)(ix) “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 there from 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
 - b) if such variation would increase the Contract Price by less than the amount stated in the Appendix-A to Bid.
- (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) Issuance of “Defect Liability Certificate” under Sub-Clause 62.1.
- (xiv) 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 (Design) or his representative, shall act as representative of Engineer for providing in house Engineering Servicesincludingbut not limited to the following:

- a) Review & approval of technical data/ drawings/design
- b) Interpretation of the bidding documents
- c) Review & approval of profile/plan tabling/route plan
- d) Site visits for attending any technical problem if necessary
- e) Resolution of disputes
- f) Review & approval of all technical matters

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 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 (Appendix-A to Bid);
- (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.

10.1 Performance Security

The text is deleted and substituted with the following:

The Contractor shall provide Performance Security to the Employer in the prescribed form. The said Security shall be furnished or caused to be furnished by the Contractor within 14 days after the receipt of the Letter of Acceptance. The Performance Security shall be of an amount equal to 10% of the Contract Price stated in the Letter of Acceptance. Such Security shall, at the option of the bidder, be in the form of either (a) bank guarantee from any Scheduled Bank in Pakistan or (b) bank guarantee from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan. or (c) insurance guarantee from an National Insurance company Ltd NICL having AA⁺ PACRA Rating or

acceptable to employer. The cost of complying with requirements of this Sub-Clause shall be borne by the Employer and will be reimbursed as per actual payment if paid by contractor.

The following Sub-Clause 10.4 is added:

10.4 Performance Security Binding on Variations and Changes

The Performance Security shall be binding irrespective of 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 14 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 14 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 15days. 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 8th 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 30 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.

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 as to 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

The Employer's risks are:

Notwithstanding anything contained (in GCC 20.4), the Employer shall not be responsible, compensate or bear any kind of risk/liability whatsoever in nature.

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

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 sub paragraph (a) to (h).

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 Engineer. Costs of such insurances shall be borne by the employer and actual amount will be reimbursed in case if paid by 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.

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 shall be provided in the Appendix-A to Bid "Special Stipulations".

The following Sub-Clause 49.5 is added:

49.5 Extensions of Defects Liability Period

The provisions of this Sub-Clause shall apply to all replacements or renewals of plant and equipment carried out by the Contractor to remedy defects and damage as if the replacements and renewals had been taken over on the date they were completed. The Defects Liability Period for the Works shall be extended by a period equal to the period during which the Works cannot be used by reason of a defect or damage. If only a part of the Works is affected the Defects Liability Period shall be extended only for that part. In neither case shall the Defects Liability Period extend beyond two (2) years from the date of taking over.

51.2 Instructions for Variations

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

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-Clauses 59.4 & 59.5 are added:

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-Clause 60.11 (a)(6) hereof”.

(in case Clause 60.11 is applicable)

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.

67.1 Engineer’s Decision

Executive Engineer (EHV-II) or any person nominated by the Employer will act as Engineer for resolution of Disputes.

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 is: National Transmission and Despatch Company (NTDC)
Project Director (EHV-II) NTDC, Multan.
- (b) The Engineer is:
Executive Engineer-II, (EHV-II) Construction Division NTDC Multan.
- Or
Any person nominated by the Employer

69.0 Default of Employer

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

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

(Employer may incorporate provisions where applicable)

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-L 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 14 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.

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 & Special Provisions

TECHNICAL PROVISIONS FOR CONSTRUCTION OF TRANSMISSION LINES

1.1 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 centre line, tower locations and conductor pulling sites within 15 metres on each side of the centre line. Trees over 2.5 metres in height which constitute a hazard or danger to the transmission line, or whose tops are within 6 metres of the 65°C final conductor 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 off by burning or other methods approved by the Engineer.

(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 contractor. 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:

- (i) 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.

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

- (ii) 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.
- (iii) The contractor shall also be responsible to prepare plan tabling and profile drawings, tower spotting and construction structure list of any diversion route.
- (iv) 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.
- (v) 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 centre of the line. This point shall be further encircled by red paint.

(3) Tower Staking

Tower centers shall be staked in the field along with two reference stakes on either side of the tower along the line route, using wooden pegs. All angle tower locations shall be bisected.

It shall be the Contractor's responsibility to supply the construction engineering not specifically reserved for the Engineer in these specifications.

1.2 Sub Soil Investigation

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 wash boring or rotary drilling, field testing, ground water observations, soil sampling and laboratory testing. The location of investigation boreholes on the ground shall be established by the Contractor in accordance with the Drawings and from reference points to be provided by the Engineer as per requirement.

- | | |
|--------------------------------------|--|
| 1. All Angle and Dead-end towers | 15 meters |
| 2. Every ninth Tangent tower | 10 meters |
| 3. Any other specific tower location | upto 40 meters
as approved by the Engineer. |

(a) Method of Drilling

Drilling shall be done by rotary or wash boring method or the combination of two methods 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 be allowed to use percussion method where gravels & boulders are encountered.

(b) 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.

(c) 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 rods whichever is encountered earlier.

(d) Drilling Fluid

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

(e) Casing of Boreholes.

- (i) 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.
- (ii) The casing shall be made of cylindrical steel pipes and shall have sufficient strength so as to maintain position and shape during drilling operations.
- (iii) The casing may be omitted only where it can be shown to the satisfaction of the Engineer/Engineer's Representative 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.
- (iv) 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.

(f) 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 forcing the standard sampler 305 mm (12 inches) into the soil. Standard Penetration Tests shall be conducted in the bore holes at one metre interval from 1 metre depth to 10/15 metre depth of bore hole and upto 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.

(g) 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.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.

(h) Labeling and Disposition of Samples

Each sample shall have identification tags giving information regarding Sample No., Top Elevation of Hole, Date of Sampling, Depth and Length of Sample, and Description of Sample.

All the samples shall be delivered to the Engineer's Representative at his office at the Site. The selected undisturbed and disturbed samples shall be carefully transported by the Contractor to the approved testing laboratory for testing. 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 shall be well packed in wooden boxes to protect the samples against vibration.

(i) 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.

(j) Laboratory Tests

(i) General

- The laboratories in which the samples are to be tested shall be approved by the Engineer.
- The Engineer's Representative 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. The samples to be tested and the test to be carried out for each sample shall be specified by the Engineer. Laboratory testing may include but is not limited to the tests listed below:

- Grain Size Analysis (Sieve + Hydrometer)
- Atterberg's Limits
- Chloride Content (soil and water)
- Natural Moisture Content
- Bulk and Dry Densities
- Organic Matter Content
- Sulphate Content (soil and water)
- PH value (soil and water)
- Unconfined Compression Test
- Direct Shear Test
- Consolidation Test
- Total Soluble Salts.

(k) Confirmatory Sub-soil Investigation

After preliminary subsoil investigations confirmatory investigation upto maximum depths of 25 meters will be carried out by the contractor. The location of selected confirmatory investigation will be conveyed to the Contractor by the Engineer.

(l) Decision on the Type of Foundation to Be Made

After soil investigation, based upon the results, the contractor will propose foundation type for each location as per the actual site data and submit for the approval of Engineer. After approval of Engineer, the work will be executed at site. The contractor will intimate to the Engineer about any change in the already approved design/ work before the execution of the work at site and will not do any such work without prior approval.

1.3. **Foundation Requirements**

(1) General

The items of the Bid Schedule for constructing the various types of concrete foundations (including pile foundation) for steel towers include the following:

- (a) Performing all clearing and leveling as required to construct the footings and erect the steel towers and poles.
- (b) Performing all required excavation, dewatering, shuttering, compacting backfill for the concrete footings.
- (c) Installing steel stub angles for towers in the concrete footings.
- (d) Tower grounding before placement of concrete.
- (e) All concrete work for the concrete footings, including the cost of furnishing all reinforcing bars, and all materials for concrete.
- (f) Installing pile foundations where required.

The specific requirements for performing the individual portions of the work to construct the concrete foundations are included in the paragraphs pertaining to the individual work to be performed.

(2) Excavation for Tower Footings

The Contractor shall perform all excavation required for constructing various types of concrete foundations for the steel towers.

The tower sites shall be leveled 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 of as directed by the Engineer/Engineer's Representative.

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 or the Engineer's representative 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 the Engineer's representative will either designate another type of footing or ask for compacted crushed stone mixed with sand to be placed underneath the footing for a depth of upto 1.2 metres. The Contractor will be paid only for the type of footing actually installed.

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. No payment will be made to the replaced material underneath the footing.

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/Engineer's Representative.

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. Rocks are classified as sound and mashees, layers or ledges of mineral material 0.241 cubic metres in volume in place and of such hardness and texture that it can not be easily loosened or broken down.

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/Engineer's Representative. 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/Engineer's Representative. 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 or stones in gabion boxes 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 lining after filling with earth as per specifications/drawings or as directed by the Engineer.

(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.

All pile foundations as shown on drawings are of preliminary nature and depths of piles have been indicated for bidding only. The final design may vary with respect to the length and diameter of pile and other details shown on drawings.

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.

(6) Placing of Stub Angles in Footings

Stub angles shall be placed in the tower footings 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 centre-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 centre 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 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 6.5mm dia copper 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' 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/Engineer's Representative. No extra payment would be allowed 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 should 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, air-entraining agent 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. If the Contractor purchases cement from within the country, EMPLOYER shall help arrange cement allotments for the Contractor, but in no way be responsible for the timely supply of cement, nor for the quantity needed by the Contractor.

(i) Cement

Cement shall meet the requirements of ASTM C-150 and shall meet the false-set limitation specified therein. The cement shall be free from lumps and damaged cement, when used in concrete. Adequate provisions shall be made to prevent absorption of moisture when cement is stored. Cement Type I shall be used for all types of foundations other than those for which sulphate resistant cement type V is required by the Engineer. No extra payment would be made to the Contractor in case sulphate resistant cement is used.

(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 38 mm or as directed by the Engineer. The grading of these sizes shall conform to ASTM C-33.

The Contractor shall submit, for testing and approval, representative samples of the sand and coarse aggregate proposed for use in the concrete work. All aggregates shall conform to the requirements of ASTM C-33. 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 laboratories testing of these samples shall be borne by the Contractor.

(iii) Water

Water shall be free from objectionable quantities of silt, organic matter, alkalies, salts or other impurities.

(iv) Reinforcing Bars

Reinforcing bars shall be deformed bars conforming to ASTM Designation A 615, Grade 40 except for tower type JKD where Grade 60 shall be used.

(v) Curing Compound

Curing compound shall be wax-base and white-pigmented.

(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 kgs per cubic meter, and concrete which contains 19 mm maximum size aggregate shall have a cement content of not less than 391 kg per cubic meter with one extra bag per cubic meter in case of water encountered during concreting of piles. 38 mm maximum size aggregate shall be used for spread footing 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 three test cylinders per leg, and the average compressive strength at 28 days shall exceed 211 kg/cm² (3000 psi) and 281 kg/cm² (4000 psi) as the case may be 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 (150 x 300 mm) cylinders made and tested in accordance with ASTM C-39. 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/Engineer's Representative. The cost of the material lab tests shall be borne by the Contractor.

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 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 forms 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 trucks, buckets, chutes and pumping. Aluminium pipe or chutes shall not be used for tremie trunk line, or chute for placing of concrete, or for the delivery of pumped concrete. Retempering 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 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. 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.

(g) Protection and Curing

The Contractor shall protect all concrete against injury until final acceptance.

The concrete shall be cured with two coats of approved membrane type curing compound to be applied 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's approval. The application of the curing compound shall be in accordance with the procedures outlined by the Manufacturer.

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 shall be made on this account.

(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 Engineer's representative. 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.

(i) Tolerances for footings:

- | | |
|--|--|
| - Variation from plumb
or specified batter
for lines and surfaces
of stems. Maximum for entire length | In any length of 3.0
metres 13 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 dimension 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
(ii) Tolerance for placing reinforcing steel:	
- Variation of protective covering:	with cover of 64 mm or less 7 mm with cover of more than 64 mm 13 mm
- Variation from indicated spacing	 26 mm

(11) 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's Representative, for use as backfill, the Contractor shall obtain suitable material from the borrow. No borrow pits shall be made within 25 metre radius from centre 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 ponding 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 granularities within the following limits.

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

(12) 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/Engineer's Representative.

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 D-1556 or ASTM D-2167 by the Contractor in the presence of Engineer's representative to determine compliance with the specified degree of compaction. The cost of all laboratory and field testing shall be borne by the Contractor.

(13) 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.

(14) Foundation Test (if required)

The Contractor may be required to perform an uplift load test on any one footing for 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.

Payment for foundation test will be as stipulated in Bid Schedule.

1.4 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) Carrying out subsoil investigations at the tower locations through drilling, testing and sampling.
- (ii) Construction of bored, cast-in-place reinforced concrete piles as shown in the Drawings.
- (iii) Complete bore hole logs and record of all operations performed during the investigations and the execution of the Work.

(b) Location of Investigation Borehole and Piles

- (i) The location of investigation boreholes and piles on the ground shall be established by the Contractor in accordance with the Drawings and from reference points to be provided by the Engineer. Establishing the investigation borehole and pile locations accurately in the field shall be the sole responsibility of the Contractor.

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

(c) **Number, Diameter and Length of Investigation Borehole and Piles**

- (i) One investigation borehole, not smaller than NX size, the hole diameter approximately 75 mm shall be drilled at each location of tower where pile foundations are proposed to a depth of 25 metres from the general ground level, or 3 metres below the pile tip whichever is greater.
- (ii) Bored, cast-in-place reinforced concrete piles shall be constructed having uniform diameter throughout the length as specified in the relevant drawings. Pile footings shall only be installed where the field and laboratory tests confirm the requirements. The final length of the piles shall also be confirmed after testing.

(d) **Containers**

For preserving and transporting soil and water samples collected from subsoil investigations the Contractor shall furnish jars, tubes, boxes, bags and crates, meeting the requirements as specified in these Specification. All such containers shall become the property of EMPLOYER and the cost thereof shall be included in the Contract Price.

(e) **Care and Delivery of Samples**

- (i) Contractor shall be solely responsible for preserving all samples in good condition. He shall keep samples away from undue exposure to the weather, and shall keep descriptive labels and designations on sample jars and boxes clean and legible until final delivery of samples to the laboratories approved by the Engineer. The Contractor shall make arrangements for waxing of samples as directed by the Engineer.
- (ii) All samples shall be submitted to the Engineer's Representative for approval before they are transported to the testing laboratory.
- (iii) The Contractor shall arrange for all samples to be safely packed and careful transportation to a laboratory or to a place of storage designated by the Engineer.

(f) **Drillers and Supervisory Staff**

The Contractor shall have at Site, at all times only qualified, experienced, orderly and thoroughly competent persons including graduate engineers/geologists who shall conduct and supervise drilling operations, 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) Drilling and Stabilizing of bore holes for the piles.
- (ii) Placing of steel reinforcement.
- (iii) 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 described 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 mud circulation or reverse rotary method or by any other method suggested by the Contractor at the time of bidding 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.

(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/betonies. Permanent casing shall only be allowed with the prior approval of Engineer.

(d) **Tolerances**

Tolerances for setting out and for concrete construction shall conform to Clause 1.3 hereof. 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 hereof. In addition to this, following requirements shall also be fulfilled.

- (i) Promptly after cleaning of the hole to the entire satisfaction of the Engineer's 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. Concrete placed by tremie through water shall have one extra sack of cement per cubic meter and the slump shall be limited to 150 mm maximum.
- (ii) Either tremied or pumped-in concrete can be used in presence of water or of drilling mud. The method and equipment used shall be subject to the prior approval of the Engineer.
- (iii) Concrete placement shall proceed without interruption until the pile is complete.
- (iv) The Contractor shall make three test cylinders per pile or as directed by the Engineer's Representative during the concreting of piles.

(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 prior to their delivery to him. The following information shall be included in the records for each pile.

(i) **Investigation Bore hole**

- Hole number of designation, coordinates and elevations of top of the hole.
- Type of drilling operations.

- Date 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.
- Description of subsoil conditions.

(ii) Piles

- 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.

The presence of the Engineer's Representative or keeping of separate records by his representative shall not relieve the Contractor of the responsibility for the Work specified in this clause. Payment will not be made if records have not been furnished by the Contractor.

1.5 Tower Erection

(1) General

Contractor's work includes supply of manpower, provide construction equipment, vehicles rigging tackles for complete assembly of towers.

Profile drawing indicating the location, height and type of each tower and the construction data sheets showing the length of leg extension for each of the four legs of each tower will be submitted by contractor after final survey for approval of the Engineer.

Erection shall be done strictly in accordance with the 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 tower/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.

(3) Equipment and Methods

All assembly and erection shall be by methods and equipment that will not cause damage to, or distort, any part of the tower/pole. Extreme care shall be taken to establish and maintain the true geometric shape of the sections of tower assembled.

Reaming shall be done only with the approval of the Engineer's Representative, 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.

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 - metres and 20 mm and 24 mm diameter bolts to a torque 17-23 kg-metres. All bolts after torquing shall be centre 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, if locknuts are not to be provided under the specification and drawings. However, for tower type JKD locknuts are used for locking of nuts.

All nuts shall be so attached that they will be in an upward or outward position, unless such positioning is clearly impracticable.

When sections of towers are being assembled prior to erection, assembly shall be on blocking 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.

When erecting assembled sections of a tower, a bridle and spreader with proper points of attachment shall be used when necessary to avoid distortion or oversteering. Adequate tag lines shall be used to insure that no section of the tower being lifted will drag on the ground or against any section of the tower already erected.

At all times at least 50 percent of the bolts in each connection of erected tower members shall be inserted. Until all the bolts in the face of a section of a tower are inserted, those bolts inserted in that face during erection shall be finger- tightened only.

(4) Correction of Misfabricated and Damaged Steel

All shop errors and damaged steel shall be reported to the Engineer or Engineer's Representative 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.

(5) Damage to Galvanizing

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. The paint will be furnished by the Contractor.

Damaged area shall be wiped with clean rags saturated with Xylene or equivalent solvent, followed by wire brushing then reclinced 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 aluminium 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.

(6) Tower Signs and Aerial Markers

Tower signs (danger sign, number signs and phase 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 manufacture, a sample shall be submitted to the Engineer for approval.

(7) Anti-climbing Devices

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 complete.

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 A 153. 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 shall be carried out by the Contractor without any extra cost.

After erection, tower shall be cleaned of any foreign matter.

(8) Anti-Bird Devices

All poles shall have detachable anti-bird devices, over each suspension/jumper insulator string. These anti-bird devices shall be spike type and galvanized and can be fixed on cross-arms by use of bolts and nuts.

1.6 Installation of 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 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.

1.7 Stringing Conductor and Overhead Shield Wire

(1) General

The conductor and overhead shield wire shall be strung on double circuit towers as single & twin conductor bundle per phase.

(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 following minimum safety and grounding procedures shall be followed by the Contractor during stringing operations in the Sections with parallel existing high voltage lines.

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.

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 overhead shield wire. 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 overhead shield wires are being compressed/terminated to dead-end assemblies or spliced at ground level. The two ends to be spliced shall be effectively bonded together prior to and during splicing operation. Splicing and compression/termination 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 overhead shield wires 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 required special safety precautions, only the provision of the grounding at the pulling and tensioning stations shall be required.

All herein specified provisions shall not prevent 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 overhead shield wires 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 overhead shield wire, 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, nor string conductors or overhead shield wires over, energized power circuits until a Hot-Line Order is placed on the energized line i.e., until "Permit to Work" has been arranged from relevant quarters.

Qualified personnel shall remain at the site of work while the Hot-Line Order (Permit to Work) 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 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 metres at midspan 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 twelve reels for twin bundle conductor double circuit line & six reels for single conductor double circuit line

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 unreeling 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 two 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.

The two 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 metres 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 and shield wires 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.

Two 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 different sag which will separate them at least 150 mm vertically from either of the other sub-conductor at midspan. 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's Representative. 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 these specifications.

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 and shield wire reels, tensioners, and pulling machines shall be located as near to midspan as possible but in no case shall the slope of the shield wire 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 metres 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 shield wires 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 Shield Wires

One 9.0 mm dia. 7 strand galvanized Overhead Shield Wire (as required) shall be strung for the entire length either before or at the same time the conductors are strung.

The specifications used for handling and stringing the Overhead Shield Wire shall be the same as for the conductors. However, the contractor shall submit his proposal regarding specifications to be used for handling and stringing of OPGW and wrapping of Fiber Optic Cable on Shield wire of the existing transmission line which shall be followed after approval by the Engineer

(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 Engineer. 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 metre 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 metres above the ground for a minimum period of 15 minutes. A thermometer in a container which simulates 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 4,000 metres to 8,000 metres.

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 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 metres 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 twin conductor bundle the sag of the two sub-conductors shall be the same.

A tolerance of plus or minus 10 mm of sag per 30 metre of horizontal span length, but not to exceed 150 mm in any one span, will be permitted, provided; 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. 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 centreline 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 twin bundle insulator strings 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 Shield Wire/OPGW Accessories

(a) Splices and Dead Ends

All splices shall be of the compression type.

All splices shall be made at least 15 metres away from structures and no splices shall be made in dead-end spans or spans greater than 600 metres or spans crossing over the highways, railroads, major canals, rivers and transmission lines of voltages greater than 35 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 metres 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 the Engineer's representative.

If the completed splice or dead-end is not satisfactory, in the opinion of the Engineer, or Engineer's representative, 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 & Shield Wire

Damage is any deformity on the surface of the conductor or shield wire 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 or shield wire

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/Engineer's Representative 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's Representative 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.

For the repair of the shield wires, only compression joints shall be used.

(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.

At conductor and overhead shield wire dead-ends with bolted strain clamps, sufficient length of wire to form the jumper loop to clear the tower shall be allowed. Parallel groove bolted clamps will be used for connection.

1.8 Installation of Dampers

(1) Spacer Dampers

The two 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 conductor in case of single conductor per phase arrangement and overhead shield wire at the ends of all spans and as designated on the data sheets. The vibration dampers shall be fastened securely to conductor and overhead shield wires 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

1.9 Pre Commissioning and Commissioning Tests

A. Pre Commissioning Tests

(a) Mechanical Tests

1. For steel structures, ensure that structure type is as per specification/ drawings/ structure list.
2. Check galvanizing and thickness (rust is not acceptable).
3. Check bolt types and tightness (torque wrench method).
4. Ensure anti-climbing guards are correctly installed.
5. Check step bolt tightness.
6. For 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.
7. Make sure that insulators are clean and line is safe to be energized.
8. Check that all line hardware (insulators, corona rings, vibration dampers, spacers, conductor clamps, armor rods, etc) is installed correctly and in correct locations as per specifications and drawings.
9. Check that all splices are correct and installed in correct span locations.
10. Check that all jumpers are installed correctly. Ensure correct clearances between jumper and structure as well as with other phases at acute angle locations.
11. Ensure there is no twist in the insulator string.
12. Check that overhead shield wire and OPGW are grounded to towers as specified.
13. Ensure that sags for phase and overhead ground conductors are even and according to the specification.
14. Check that ground clearances are as per specification.

15. 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.
16. Check line/phase correctly transposed at the specified locations and clearance between the phases is as per specification.

(b) Electrical Tests

1. Check tower footing resistance as per specification.
2. Verification of physical phase arrangement.
3. Perform sequence impedance test (both zero and positive sequence).
4. Perform continuity and insulation test of complete transmission line with appropriate test equipment.

B. Commissioning Tests

1. Perform phase sequence/rotation check.
2. Inspection of Facilities for any visual/audible abnormality
3. HIPOT test at 80KV DC or above level .

Special Provisions

SI-01 DESCRIPTION OF PROJECT

SI-01.1 General

The following overhead transmission line shall be constructed and completed on Survey for Tower Staking, Foundations, Erection, Stringing, Testing and Commissioning basis, in accordance with the Bidding Documents.

RAISING OF 220KV SP-BH TERMINAL POLE OF 220KV TRANSMISSION LINE JAMSHORO-T.M KHAN ROAD AT 500KV GRID STATION JAMSHORO INCLUDING CIVIL WORKS, DIMANTLING, TRANSPORTATION, ERECTION, STRINGING, TESTING AND COMMISSIONING

SI-01.2 Location of Site

- i) 500kV Grid Station Jamshoro
- ii) The project site is easily accessible by roads.

SI-02 MATERIAL AND WORKMANSHIP

SI-02.1 Material and Workmanship

- (1) All services in context of construction of the T/Line along with its associated works shall comply with the requirements of the Contract Documents. All Services, Work or parts shall comply with the applicable standards, rules, codes and regulations of the internationally approved standardizing bodies.
- (2) The intent of these Specifications is that the services and workmanship of Work under this Contract should be equal to or superior than those actually described herein.
- (3) In choosing materials (**IF ANY**) 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 services, Work and materials offered under this Contract shall be decided by the Engineer whose decision shall be final.

SI-02.2 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 services which are not specifically mentioned in the Contract Documents, but which, in the opinion of the Engineer, are usual or necessary for the satisfactory completion of the Work shall be deemed to be included in the Contract Documents and shall be provided by the Contractor without extra cost to EMPLOYER.

SI-03 WORK BY CONTRACTOR

SI-03.1 Scope of Work

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

- a. Dismantling of existing 220kV SP-BH Pole (Terminal Pole) of 220kV Transmission Line Jamshoro – T.M Khan at 500kV Grid Station Jamshoro, for civil work, along with Provisions of access roads/paths where necessary.

- b. Clearing right of way including disposal of cleared materials.
- c. Detailed survey for the entire line route may not be required, since the same has already been carried earlier and the profile of the same will be provided for starting the work. Detailed survey, where required, including route alignment, profiling, tower spotting, optimization of tower locations, soil resistivity measurement & geotechnical investigation.
- d. The coordinates of all the tower locations shall also be recorded using GPS/DGPS of positional accuracy of at least 1m for easy relocating. The position of all tower locations shall be marked in the final digitized route alignment drawing with relative distances from any permanent bench mark area.
- e. Preparation of construction structure lists as per already approved profile and plan tabling.
- f. Excavation, dewatering, shuttering, leveling/grading, slope protection (where necessary), backfilling and compaction including disposal of surplus excavated material.
- g. Furnishing materials for and constructing reinforced concrete tower foundations including installation of steel stub angles and tower grounding.
- h. Erection of dismantled 220kV SP-BH Pole after completion of civil works as per approved drawing, welding of bolts and nuts including supply and application of zinc rich primer & two coats of enamel paint.
- i. Installing insulator assemblies for conductors and suspension/tension assemblies for conductor and OPGW and Shield wire.
- J. Stringing conductor alongwith shield wire with installation of hardware, accessories, joint boxes and dampers upto sub station gantry tower of the lines.
- k. Installing tower signs (danger sings, number signs and phase plates etc.) and anti climbing devices.
- l. Clean up of right of way.
- m. Testing and commissioning of all above said T/Line works.
- n. Handing over of all surplus goods and materials after completion of work.
- o. Preparation and submission of progress reports including site photographs, as built data (including computer compact diskettes: CD) manuals including project completion report.
- p. Any other work not mentioned above but deemed necessary by the contractor/engineer for the completion of the work and its successful/smooth operation will be considered a part of the scope of work under the contract.

NOTE:-

- (1) All type of Goods which are to be installed/Erected will be supplied by Employer from its store.

- (2) Design & Engineering of the project is not a part of the scope. As such all the relevant drawings have been made a part of the bidding document. Any drawing missing will be provided to the successful bidder as and when required.
- (3) Employer shall not give any equipment/T&P for survey, foundations, erection and stringing to the contractor for this project. It is also mentioned that the stringing equipment/T&P and other construction equipment/T&P shall have to be arranged/imported by the contractors.
- (4) The contractor is responsible to mobilize sufficient numbers of crews for surveying, dismantling, foundation work, Pole erection and stringing each equipped with T&P complete in all respects for smooth execution of each activity. Contractor is responsible for timely completion, to adhere project schedule and ensure that the sufficient resources are available with the crews before commencement of each activity. Detailed methodology and list of T&P should be got approved from the Employer's Representative well before the commencement of each activity.
- (5) In case Contractor fails to arrange the required numbers of crews along with requisite T&P in good working condition for inspection at site prior to commencement of respective activity, Employer has the right, in addition to withhold current payment, terminate the Contract at any stage and to get executed the balance installation Service through other Contractors at the Contractor's risk and cost.

SI-04 DRAWINGS

SI-04.1 Drawings in Contract

SI-04.1.1 Specification Drawings

The specification drawings contained in the Bidding Documents show the scope of Work to be performed by the Contractor. The specification drawings shall not be used for execution of the Work unless specific instructions for such use are given by the Engineer.

SI-04.1.2 Approved Drawings

The Work shall be performed in accordance with the approved drawings in terms of relevant clauses of the Conditions of Contract.

SI-04.1.3 Drawings, Data and Instruction Manuals

The following data/drawings shall be submitted within the time stated against each calculated from the date of receipt of Letter of Acceptance.:

- | | |
|---|-------------|
| 1. Representative (Key person) of the Contractor. | Immediately |
| 2. Work Programme | 07 days |

SI-04.2. Data Other Than Drawings

All of the applicable requirements of this Clause with reference to drawings to be prepared by the Contractor shall apply equally to catalogues, illustrations, printed specifications, or other data submitted for approval.

SI-05 STANDARDS AND TYPICAL DESIGN

SI-05.1 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, and 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 no alternatives are set forth by the bidder, 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 have 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 Engineer an equivalent standard other than that specified, in which case he shall submit the proposed standard and all other information required by the Engineer and shall submit written demonstration that his proposed standard is equivalent to or superior to the one specified herein. The submission must be made in English language. Moreover the bidder shall also supply copy of the latest revision of the standards used in his design.

SI-05.2 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 Engineer may be given to the use of other national standards prevalent in the country of manufacture. No departure from the standard specified will be considered after the Contract has been awarded unless specific authorization is requested in writing from the Engineer.

SI-6.1 Lifting

The method of lifting, type of equipment and type of slings, used for handling the reels and other goods are subject to approval by the Engineer. The reels are so constructed as to be supported either on an axle through the arbor holes or by the reel flange. When the reels are lifted by an axle supported from above, 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, OPGW or Fiber Optic Cable.

SI-6.2 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.

SI-7 TRANSPORTATION OF GOODS

SI-7.1 General

- (1) The Contractor shall insure and transport the Goods, materials and his Equipment from EMPLOYER store to the Site and shall be solely responsible for selection of routes and carriers, and expediting in order that all Goods are safely and expeditiously transported to the Site.

- (2) The Contractor however, shall be solely responsible for satisfying himself at the time of transportation as to the adequacy of the road surfaces and structures. All costs related with reinforcement of roads, structures, diversions and the like, if any, shall be borne by the Contractor. The Contractor shall advise the concerned authorities in advance of the proposed transit of the heaviest and largest items of Goods and Equipment and shall comply with instructions given by said authorities.
- (3) 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.

SI-7.2 Loading, Transporting, Unloading and Storage at the Site

- (1) The Contractor shall load Goods from NTDC Store -, transport & unload all Goods and other material (except Spare Parts) at the Site. 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.

SI-7.3 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 Employer. All the packing materials shall be handed over to Employer immediately after storage requirements of the Goods or part thereof and other materials are over.

SI-7.4 Receiving Reports and/or Damage Reports

- (1) The Contractor shall prepare and submit receiving reports to Employer and the Engineer to cover shipments/goods received and checked at the job Site and/or storage area. Shipment on arrival at the job Site and/or storage area shall be unloaded, opened, and carefully checked by the Contractor in the presence of a designated representative of the Engineer/Employer for any loss and damages in transit. In the event of loss and/or damage, the Contractor shall immediately report to Employer /Engineer. Prompt action shall be taken by the Contractor with intimation to Engineer/Employer, 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.

SI-8 SCHEDULE, PROGRESS REPORTS AND MEETINGS

SI-8.1 Schedule

The Contractor shall carry out the Work in accordance with the dates/ periods specified in Particular Condition of Contract and with the Schedule which shall be provided as per the relevant Conditions of Contract. The Contractor shall regularly review the Schedule and notify the Engineer promptly of any revisions which in his view may be required from time to time.

SI-8.1.1 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 Engineer that the Work is thoroughly planned and meets all the requirements of the Contract Documents.

SI-8.1.2**Erection/Construction**

- (1) The collection of the Goods from Employer storage yard should be so estimated so as to permit erection work and construction work to proceed in an orderly manner so that the Work can be completed by the required Commissioning Dates.
- (2) The Contractor shall promptly bring to the attention of the Engineer 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.

SI-8.2**Progress Reports**

- (1) The Contractor within fourteen (14) days of the signing of the Contract shall submit in writing for the approval of Engineer a Schedule for the civil works, erection, testing and commissioning of the T/Line.
- (2) The submission to or approval by the Engineer/EMPLOYER of such Schedule etc. shall not relieve the Contractor of any of his duties or responsibilities under the Contract.
- (3) At bi-weekly intervals after submission of the Schedule, the Contractor shall submit to the Engineer up to six (6) copies of a written detailed progress report in an approved form together with copies of the above mentioned Schedule indicating the stage reached in transportation of goods, erection/construction, in percentage terms. Such bi-weekly 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 closing of bi-week. The numbers of copies shall be as stipulated in the Specifications or as instructed by the Engineer.
- (4) The Engineer shall at all reasonable times be afforded access to the Contractor and any Sub-Contractor's premises for the purpose of ascertaining progress.

SI-8.3**Meetings**

- (1) Soon after the date of signing of Contract, the Engineer will, with the approval of EMPLOYER require a conference with EMPLOYER and the Contractor at a place mutually agreed upon, to discuss scheduling of scheduled sequences 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 Engineer may call meetings, either in his Offices or at the Contractor's Offices in Pakistan or EMPLOYER 's 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.

SI-9**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.

SI-9.1 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 labour 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.

SI-9.2 Offices

The Contractor shall arrange and maintain his offices at his own cost.

SI-9.3 Work yards and Storage Areas

- (1) No storage site shall be provided by EMPLOYER 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 EMPLOYER taking over the Work.

SI-9.4 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 EMPLOYER and/or Engineer at all times.
- (2) Such temporary buildings and/or utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the Work and the Site reinstated to its original condition, all to the approval of the Engineer.

SI-10 MEASUREMENT FOR PAYMENT AND PAYMENT

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

(1) Erection, Stringing and Commissioning including Civil Work

(a) Construct Right-of-Way Road

No payment will be made for the construction of a right-of-way road. The cost of such road, if constructed, shall be deemed to be included in other prices in the Bid.

EMPLOYER will pay the compensation for unavoidable crop damage that occurs on the right of way in cultivated areas. The cost for access routes/paths to the right-of-way, will be deemed to be included in the Bid.

(b) Clearing Right-of-Way

Measurement for payment will be made based on the percent of right-of-way cleared and disposal completed.

Payment will be made based on the lumpsum price bided. The lumpsum price shall include, but not be limited to, the cost of clearing a 30 metre wide right-of-way including cutting, grubbing, hauling, burning and clean-up and other Work necessary to complete the required cleaning.

(c) **Survey**

Measurement for payment will be made horizontally along the centre line of the line route.

Payment will be made based on the unit price bided per km The unit price bided shall include but not be limited to the survey including pegging out and layout of tower locations, staking of towers, preparation of construction structure list as per already approved profile and plan tabling and all other work necessary for the completion of this phase of work.

(d) **Reinforced Concrete Foundations**

Measurement for payment will be made for completed foundation work as shown on the relevant drawings for foundation.

Payment will be made based on the unit prices bided for each type of foundation. The unit price shall include, but not be limited to, the cost of furnishing all labor, Equipment, Materials (including concrete and reinforcement etc.) site leveling, excavation, shuttering, dewatering, shoring, forming, reinforcing, concreting, curing, backfilling, installing stub angles and tower grounding, setting, final tower site grading, slope protection (where necessary) and all other associated work as necessary to produce finished foundations.

~~(e) **Dismantling of 220kV SP-BH Pole**~~

~~**Measurement** under this item shall be made as dismantling of 220kV SP-BH Pole along with conductor and OPGW wire along with hardware as shown on the Drawings and according to the Specifications.~~

~~**Payment** shall be made in accordance with the unit price bided in the "Price Schedule". Such unit price shall constitute full compensation for dismantling and safe placing of the hardware, Pole and accessories to the satisfaction of the Engineer.~~

(f) **220kV SP-BH Pole Erection**

Measurement for payment will be made for component installed as shown on the relevant drawings for the SP-BH Pole.

Payment will be made based on the unit prices bided for 220kV SP-BH Pole. The unit prices shall include, but not be limited to the cost of all labor, equipment, requisitioning, loading, transporting, from EMPLOYER storage yard to the sites, erecting together with bolts, nuts, washers, step bolts, including back bolting and punching of nuts and bolts and all other associated work necessary for the completion of the towers ready for installation of overhead shield wire and conductors thereon.

(g) **Insulator's Assemblies & Shield Wire Assemblies**

Measurement for payment will be made for each type of assembly installed as shown on the relevant drawings.

Payment will be made based on the unit prices bided for each type of assembly. The unit prices shall include, but not be limited to the cost of all labor, equipment, transporting from EMPLOYER storage yard to sites and other associated work necessary for the complete installation of the assemblies..

(j) **Stringing of Conductor and OPGW:**

Measurement for payment will be made horizontally along the center line of the line route.

Payment will be made based on the unit price bided per km. The unit prices shall include, but not be limited to, the cost of all labor, equipment, requisitioning, loading, transporting from EMPLOYER storage yard to sites, distributing, stringing, sagging, clipping-in, dead-ends, jumpers ,installation of spacer dampers and stock bridge dampers, together with all hardware as shown on the relevant drawings, and all other associated work necessary for the completion of this phase of the Work.

(k) **Installing Accessories for Conductor**

Measurement for payment will be made for each type of accessory installed as shown on the relevant drawing.

Payment will be made based on the unit price bided for installing each type of accessory. The unit price shall include, but not be limited to, the cost of all labor, equipment, transportation from EMPLOYER storage yard to site and other associated work necessary for the complete installation of the accessories for conductor.

(l) **Dismantling of Existing Pole**

Measurement for payment will be made for dismantling of 220kV SP-BH Pole and safe placing for re-installation after completion of civil works.

Payment will be based on the unit price bided for dismantling of SP-BH Pole. The unit price shall include, but not be limited to, the cost of all labor, Equipment, transportation from site to safe place at site for re-installation after completion of requisite civil work

(m) **Dismantling of Existing Conductor and Shield Wire**

Measurement for payment will be made according to following criteria

- i)** Shifting and accountal of dismantled T/Line Hardware Material 20%
- ii)** Shifting and Dismantling of Conductor 60%
- iii)** Shifting and Dismantling of Shield wire 20%

Payment will be made based on splitting the lumpsum price(according to above criteria) bided for dismantling and shifting of conductor and shield wire and other Transmission Line hardware material including proper stacking and accountal of material at concerned GSO NTDC store designated for return of material by the Employer.

SI-11 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".

SI-12 COMMUNICATIONS TO THE ENGINEER

All communications to Engineer by the Contractor shall address as follows:

**PROJECT DIRECTOR (EHV-II), NGC,
Bungalow #86, Block-L, Shah Rukn-e-Alam Colony, Multan**