

# **INVITATION FOR BIDS**

## **TLS-18-2024: Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines Geotechnical Investigations for 500 kV T/Lines LOT-I & LOT-II**

**1) LOT-I: 500kV Double Circuit (D/C) T/Line from Matiari Converter Station to Moro Substation (Approx. 155 km).**

**2) LOT-II: 500kV Double Circuit (D/C) T/Line from Moro Substation to Rahim Yar Khan Substation (Approx. 335 km).**

**National Engineering Services Pakistan (Pvt.) Limited (NESPAK)**, invites sealed bids (Technical and Financial in separate sealed envelopes for LOT-I & LOT-II from drilling companies for carrying out the geotechnical investigations for the subject project. Bidding document (i.e. Bid Invitation Letter, BOQ & Qualification Criteria) can be downloaded from **NESPAK** ([www.nespak.com.pk](http://www.nespak.com.pk)) and **PPRA** ([www.ppra.org.pk](http://www.ppra.org.pk)) website or can be obtained on submission of a written application from the address mentioned below.

A Pre-Bid meeting will take place on **June 20, 2024 (1100 hours)** at the address mentioned below.

The bidders shall submit a bid security amounting of **Rs. 250,000/-** for LOT-I and **Rs. 500,000/-** for LOT-II at the time of submission of bids in the form of pay order or bank draft in favor of M/s NESPAK. Companies capable of carrying out subject work are requested to furnish complete information in accordance with the requirement of bidding document. Sealed bids (inclusive of all taxes) must be submitted on or before the deadline **June 27, 2024 up to 1400 hours** at the address mentioned below.

Technical bids would be opened on the submission date at **1430 hours** after their receipt in the presence of those bidders who wish to be present. Financial bids would be opened after evaluation of Technical bids, at a time, date and venue announced and communicated to the technically responsive bidders in advance. NESPAK reserves the right to accept or reject any/all offers according to provision of PPRA Rules 2004.

**General Manager/Head, (Transmission Lines Section)  
Power & Mechanical Division  
NESPAK House, I-C, Block-N  
Model Town Extension, Lahore Pakistan - 54700  
Tel: +92-42-99090000 (Ext. 404)  
Fax: +92-42-99231936  
E-mail: [nespakpm@gmail.com](mailto:nespakpm@gmail.com)**

## INVITATION FOR BIDS

### **TLS-18-2024: Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines Geotechnical Investigations for 500 kV T/Lines LOT-I & LOT-II:**

- 1) **LOT-I: 500kV Double Circuit (D/C) T/Line from Matiari Converter Station to Moro Substation (Approx. 155 km).**
- 2) **LOT-II: 500kV Double Circuit (D/C) T/Line from Moro Substation to Rahim Yar Khan Substation (Approx. 335 km).**

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Technical bids would be opened on the submission date at **1430 hours** after their receipt in the presence of those bidders who wish to be present. Financial bids would be opened after evaluation of Technical bids, at a time, date and venue announced and communicated to the technically responsive bidders in advance. NESPAK reserves the right to accept or reject any/all offers according to provision of PPRA Rules 2004.

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Tel: +92-42-99090000 (Ext. 404)  
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E-mail: [nespakpm@gmail.com](mailto:nespakpm@gmail.com)

# NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED

NESPAK HOUSE, 1-C, Block-N, Model Town Extension, Lahore -54700 Pakistan

POWER & MECHANICAL DIVISION



Ref: P-42180/169/SHK/01/1890

Date: As per ad.

## TLS-18-2024: Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines for LOT-I & LOT-II

### Geotechnical Investigations for 500 kV T/Lines LOT-I & LOT-II:

#### 1) LOT-I

500 kV Double Circuit (D/C) T/Line from Matiari Converter Station to Moro Substation (Approx. 155 km).

#### 2) LOT-II

500 kV Double Circuit (D/C) T/Line from Moro Substation to Rahim Yar Khan Substation (Approx. 335 km).

### Invitation of Bids for Geotechnical Investigations (Field and Laboratory Works)

Dear Sir,

Sealed bids (**Technical and Financial in separate sealed envelopes**) are invited in accordance with the attached **BOQ** (for two LOTS, i.e. LOT-I and LOT-II, separately) and **qualification criteria** from drilling contractor's companies for carrying out geotechnical investigations for the subject project.

The Bidders may quote for one or both parts. However, to qualify for both parts the bidder shall demonstrate its capability in terms of T&P, Man Power and Financial Resources to complete the works in time as per attached qualification criteria.

The companies capable of carrying out subject work are requested to provide their sealed bids along with their Company's Profile and the following documents:

1. PEC Registration Certificate
2. Certificates of Income Tax and Provincial Sales Tax on Services
3. List of Similar Projects completed during last five years
4. Financial Capability
5. Equipment Capability
6. Personnel Capability
7. Litigation History
8. HSE Policies

The work comprises; execution of boreholes up to 25 m depth below natural surface level (NSL) in soils by straight rotary/heavy percussion/hand auger drilling method, performance of SPTs in boreholes, collection of disturbed/undisturbed soil samples and laboratory testing of selected samples. The field and laboratory work shall have to be completed according to the following time schedule for each lot separately:

Site Location	Minimum No. of Drilling Rigs Required	Time for Completion of Field Investigations	Time for Completion of Laboratory Testing	Time for Preparation of Factual Geotechnical Investigation Report	Total Time for Completion of Field and Laboratory Work
LOT-I (kmz file attached **)	4	8 weeks	2 weeks	1 weeks	11 weeks
LOT-II (kmz file attached **)	7	11 weeks	2 weeks	1 weeks	14 weeks

\*\* Note: Google kmz file of the route alignment of transmission line is attached.

Telephone : +92-42-99090000 Fax : +92-42-99231936  
E-mail : <nepakpm@nexlinx.net.pk> <nepakpm@gmail.com>  
P.O. Box : 1351, Lahore, Pakistan Website : www.nepak.com.pk



Your bid shall be valid for a time period of ninety (90) days after the bid opening. **The field work shall be executed under the instructions and full-time supervision of NESPAK engineers and the successful Bidder shall mobilize to the site on three (03) days' notice after issuance of Letter of Award/Acceptance. The Contractor shall arrange transport for Engineer's supervisory staff for site duties (from hotel to drilling sites and back to hotel). The laboratory testing shall also be carried out under the top supervision of NESPAK engineers.**

**The coordinates and elevations of all the boreholes by Total Station/GPS shall have to be provided to NESPAK before completion of investigations at site by the Contractor.** The approved laboratory, where testing is to be carried out, shall be pursued by the Contractor for timely completion of the assigned laboratory testing. The Contractor shall be responsible for providing the field borehole logs, summary of samples recovered, core photographs (hard copy and soft in DVD), summary of laboratory test results, detailed laboratory test results and factual geotechnical investigation report to NESPAK, within the contract period. **A premium of up to 25% will be admissible on the official rates of the soil laboratory, selected for testing of samples. This premium has been allowed as compensation to the Contractor for making advance payment to the laboratory and later following-up for obtaining test results in time, and obtaining approval from laboratory for supervision of laboratory testing by NESPAK's staff, as and when deemed necessary. The name of the laboratory should be provided on page 2 of 2 for each lot (Annexure-I).**

You are advised to carry out a detailed site visit to obtain firsthand information regarding site conditions before submitting the most competitive rates in the attached BOQs. Please note that the work is of sensitive nature and shall be executed by using appropriate equipment of high quality with utmost care. The Engineer holds the right to inspect the equipment before mobilization and to obtain assurance from Contractor regarding the quality of work.

A Pre-Bid meeting will take place on the date, time and place as follows:

Date: **June 20, 2024**  
Time: **1100 hours**  
Place: General Manager/Head (Transmission Lines Section)

Power & Mechanical Division  
NESPAK House, I-C, Block N,  
Model Town Extension, Lahore Pakistan - 54700

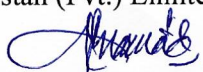
The bidders shall submit a bid security for each package, separately, as per following table, at the time of submission of bids in the form of pay order or bank draft in favor of M/s NESPAK.

Part No.	Bid Security (Rs.)
LOT-I	250,000/-
LOT-II	500,000/-

Your most competitive sealed bids (inclusive of all taxes) in accordance with the BOQ and qualification criteria, should reach the office of the undersigned by **1400 hours on June 27, 2024**. Technical bids would be opened on the same day at 1430 hours in the presence of those bidders who wish to be present.

Financial bids would be opened after evaluation of Technical bids, time, date and venue which will be announced and communicated to the technically qualified bidders in advance. However, the final decision to accept/reject any or all the bids as per PPRA rules solely lies with the undersigned. The entire work shall be carried out in accordance with the requirements of the General Bidding Documents for Geotechnical Investigations available at NESPAK website ([www.nespak.com.pk](http://www.nespak.com.pk)). Payment of the entire work shall be made directly by NESPAK.

for National Engineering Services Pakistan (Pvt.) Limited,

  
(SHAKIR HAFEEZ)  
GM/Head (Transmission Lines)  
Power & Mechanical Division

**POST QUALIFICATION OF BIDDING CONTRACTORS FOR EXECUTION OF  
TLS-18-2024: Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines for LOT-I  
& LOT-II**

**Geotechnical Investigations for 500 kV T/Lines LOT-I & LOT-II:**

**1) LOT-I**

500kV Double Circuit (D/C) T/Line from Matiari Converter Station to Moro Substation (Approx. 155 km).

**2) LOT-II**

500kV Double Circuit (D/C) T/Line from Moro Substation to Rahim Yar Khan Substation (Approx. 335 km)

**1. Qualification Criteria**

Qualification will be based on the criteria given in the following paras regarding the Applicant's experience, personnel and equipment capabilities, financial position and litigation history, as demonstrated by the Applicant's responses in the Forms attached as **Annex-A** to this Document. The Employer reserves the right to waive minor deviations, if these do not materially affect the capability of an Applicant to perform the contract by the Applicant.

Experience and resources of the Company intended to be employed as sub-contractor shall not be taken into account in determining the Applicant's compliance with the qualifying criteria. However, for joint venture, collective experience, resources and financial soundness of all partners shall be considered.

The Bidders may quote for one or both lots. However, to qualify for both parts the bidder shall demonstrate its capability in terms of T&P, Man Power and Financial Resources to complete the works in time as per attached qualification criteria.

**1.1 General Information**

The Applicant shall provide general information of his firm as per the format specified in the Application Form A-I attached in Annex-A.

**1.2 Experience of the Firm**

The Applicant shall meet the following minimum criteria:

- 1) Successful experience as contractor in the execution of at least five (05) projects involving bulk of geotechnical investigations within the last five (05) years. This experience should specifically be of geotechnical investigations of similar nature. The Applicant will supply information as per the format specified in the Application Form A-2 attached in Annex-A.

**1.3 Personnel Capabilities**

The Applicant must have in his employment, suitably qualified and experience personnel to fulfill the positions tabulated below. The Applicant will supply information as per the format specified in the Application Form A-3 attached in Annex-A for each lot separately.

Sr. No.	Position	Qualification*	No.		Minimum Experience (Years)
			LOT-I	LOT-II	
1	Technical Manager	B.Sc. Civil Engg.	1	1	10
2	Site Geologist/ Supervisor/ Engineer	M.Sc. Geology/B.Sc. Geological Engr./ B.Sc Civil Engr.	4	7	3
3	Site Geophysicists	M.Sc. Geophysics	1	1	5
4	HSE Supervisor	HSE Certification course	1	1	1
5	Driller	Literate	4	7	5
6	Skilled Labour	-	As required	As required	-

#### 1.4 Equipment Capabilities

The Applicant should own, or have assured access to the following key items of equipment in full working order, and must demonstrate that, based on known commitments, these will be available for deployment on the proposed works for each lot separately.

Sr. No.	Equipment Type & Characteristics	Minimum Number Required	
		Part-I	Part-II
1	Straight Rotary Drilling rigs complete in all respects including rods, bits, mud pumps etc. in excellent condition.	4	7
2	Percussion boring sets (>250 mm diameter) complete in all respect including tripod, chisel/bit etc.	1	2
3	Casing sets having various diameters of all types of boring at least 30 m in length with casing bits.	4	7
4	Standard Penetration test equipment complete in all respect including all rods, split spoon sampler, hammer and containers etc.	1 set for each machine.	1 set for each machine.
5	Denison/Pitcher/Shelby samplers and UDS Tubes.	3 each machine	3 each machine
6	Hydraulic jacks with all accessories for the extraction of casings.	1	2
7	Electrically operated sounders for groundwater level measurement.	2	4
8	Wooden boxes for the preservation of undisturbed soil samples including wooden separators. The width of the wooden strips should be sufficient for detailing.	As required	As required
9	Transport for mobilization of equipment	As required	As required
10	Transport (4-wheel drive) at site along with temporary site office with all accessories	As required	As required
11	Apparatus / Equipment to measure the Soil Resistivity	1	1

The Applicant will supply information as per the format specified in the application form A-4 attached in Annex-A.

### **1.5 Financial Capabilities**

The Applicant shall meet the following minimum criteria:

- 1) Annual turnover which is also termed as income from contracting for procurement of geotechnical investigations and is defined as billing for works completed during the last five (05) years of at least Rs. ten (10) million or the said figure has been achieved in any year during last five (05) years. Documentary proofs of the same shall be required in the form of letter of awards, completion certificates etc.

The Applicant shall also provide evidence of financial health such as bank account statements, available line of credits, etc., to show the soundness of the Applicant's financial position for procurement of geotechnical investigations works. The Applicant will provide annual turnover of the geotechnical investigation works carried out by him during the last five years. The Applicant will supply annual turnover information as per the format specified in the Application Form A-5 attached in Annex-A.

### **1.6 Litigation History**

The Applicant should provide accurate information on any litigation or arbitration resulting from Contracts completed or under execution over the last five (05) years. The Applicant will supply information as per the format specified in the Application Form A-6 attached in Annex-A. A consistent/ overwhelming history of award against the Applicant may result in rejection of the application. In case an Applicant claims Nil litigation, he shall submit the same statement on the letter head of his company.

### **1.7 Application of Health, Safety and Environmental Standards**

The Applicant should provide the HSE Policies and supporting documentary evidence for the following:

- First Aid Box
- Personnel Protective Equipment's (PPEs)
- Standard Operating Procedures (SOPs)
- Health, Safety and Environmental (HSE) Policies
- HSE staff

**General Information**

All individual Applicants applying for qualification are requested to complete the information in this form. Nationality information (if applicable) is also to be provided for foreign owners as required under the PEC Bye-Laws as a Partnership.

1.	Name of Firm	
2.	Head Office Address	
3.	Telephone	Contact Person: Name: Title: Cell No.
4.	Fax	E-mail
5.	Place of Incorporation/Registration Certificates of the firm*	Year of incorporation/registration

**\* Registration certificates must include:**

- Valid registration with Pakistan Engineering Council (PEC)
- Valid registration with Federal Board of Revenue (FBR)
- Valid registration with concerned Provincial Revenue Authority (PRA)
- Proof of active taxpayer of FBR & PRA



**Experience of the Firm**

Name of Applicant: \_\_\_\_\_

Sr. No.	Name of Project	Value of Geotech Contract* (Pak Rs.)	Contract Duration

*\*Attach copy of Letter of Awards / Project Completion Certificates for any five (5) latest projects involving bulk of geotechnical investigations within the last three (03) years.*

**Personnel Capabilities**

Name of Applicant: \_\_\_\_\_

Sr. No.	Name of Person	Qualification	Designation/ Position*	Total Experience

*\*Attach CVs of the Key Staff Members.*

**Equipment Capabilities**

*Name of Applicant:* \_\_\_\_\_

Sr. No.	Equipment Description	Capacity	Number of Equipment	Working Condition a) Very good b) Good c) Satisfactory	Current Location

**Financial Capabilities**

*Name of Applicant:* \_\_\_\_\_

<b>Year</b>	<b>Annual Turnover (in PKR)</b>
2022 – 2023	
2021 – 2022	
2020 – 2021	
2019 – 2020	
2018 – 2019	

*Note: Financial soundness certificate from the bank(s) as specified in section 1.5 must be provided by the Applicant*

**Litigation History**

*Name of Applicant:* \_\_\_\_\_

<b>Year</b>	<b>Award for or against Applicant</b>	<b>Name of Client, cause of litigation, and matter in dispute</b>	<b>Disputed amount (current value Pak Rs. or equivalent)</b>

**Health, Safety and Environmental (HSE) Policies Personal Protective Equipment (PPE) and Standard Operating Procedures (SOP) of the Contractor**

Name of Applicant: \_\_\_\_\_

The Applicant should provide the following policies/supporting documentary evidence as required in Para 1.7.

**A. HSE Policies**

Please attach HSE Policies

**B. Details of PPE Available with the Contractor**

<b>Sr. No.</b>	<b>Type of PPE</b>	<b>Total Number</b>

**C. Details of SOPs of the Contractor**

Please attach the copies of SOPs

Contract Document No. TLS-18-2024							
Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines for LOT-I							
Lot-I: 500 kV Double Circuit (D/C) T/Line from Mafiarri Converter Station to Moro Substation (Approx. 155 km)							
GEOTECHNICAL INVESTIGATIONS							
BILL OF QUANTITIES							
Sr. No.	Description	Unit	Qty.	Unit Rate	Amount	PST	Total Price including PST
				PKR	PKR	PKR	PKR
1	2	3	4	5	6=4x5	7	8=6+7
A.	<b>FIELD INVESTIGATIONS</b>						
	Execution of:						
A1	i) Sixty two (62) boreholes up to maximum depth of 15 m, ii) Thirty Six (36) boreholes up to maximum depth of 20 m, iii) Five (05) boreholes up to maximum depth of 25 in soils below existing ground level by straight rotary / heavy percussion method including backfilling of boreholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of borehole is 150 mm percussion method and 115 mm for straight rotary method for soil strata.	Lin.m	1645				
A2	Performance of Standard Penetration Tests (SPTs) in boreholes in soils generally at 1 to 1.5 m interval along with collection of SPT samples, including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	1525				
A3	Collection of relatively undisturbed soil samples from boreholes through Denison/ Pitcher/ Shelby sampler, including their waxing, labeling, packing, storage & transportation to an approved testing laboratory.	No.	105				
A4	Execution of augerholes of 10 m depth below NSL in soils by hand auger/light percussion method, for determination of water table, including backfilling of augerholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of augerhole is 100 mm for hand auger/light percussion method for soil strata.	No.	40				
A5	Collection of water samples from boreholes (if encountered) including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	65				
A6	Preparation and submission of a comprehensive factual geotechnical investigation report (one hard copy) which shall include but not limited to: Description of the site, details of field investigation and laboratory testing, geotechnical investigation plan, borehole logs, subsurface soil profiles, summary of laboratory test results, laboratory test result sheets and photographs of site area and field activities. All the data shall also be provided in form of original soft files (word, excel, AutoCad etc).	LUMPSUM					
A7	Measure Soil resistivity at each borehole location along with resistivity survey.	No.	110				
	<b>Sub-Total A =</b>						
Total of Price Schedule Column 8 to be carried forward to Letter of Bid.							
<p>1. Mobilization and demobilization of at least four (04) straight rotary drilling/heavy percussion drilling rigs and one (01) hand auger/light percussion drilling set along with allied accessories at site including access to the site, setting-up and shifting from one investigation point to another is included in the scope of work. The equipment shall be adequate in quantity and performance to meet the time schedule.</p> <p>2. Establishment of coordinates and ground elevations of all the investigation points using total station / GPS is included in the scope of work.</p> <p>3. Preferred method of drilling will be straight rotary method. Percussion drilling will only be allowed in case of gravely strata/as approved by Engineer</p> <p>4. All the disturbed/undisturbed soil samples shall be stored and transported as per ASTM/BS or other relevant international standards. The area ratio and clearance ratio of the thin walled tube, should be in strict compliance with relevant ASTM standard.</p> <p>5. Payment shall be made as per actual quantity of work executed at site.</p> <p>6. The Contractor shall arrange transport for Engineer's supervisory staff for site duties (from hotel to drilling site, movement from point to point and back to hotel).</p>							

<b>Contract Document No. TLS-18-2024</b> <b>Detailed Survey &amp; Sub-Soil Investigation of 500 kV Transmission Lines for LOT-I</b> <b>Lot-I: 500 kV Double Circuit (D/C) T/Line from Matiari Converter Station to Moro Substation (Approx. 155 km)</b>							
<b>GEOTECHNICAL INVESTIGATIONS</b>							
<b>BILL OF QUANTITIES</b>							
Sr. No.	Description	Unit	Qty.	Unit Rate	Amount	PST	Total Price including PST
				PKR	PKR	PKR	PKR
1	2	3	4	5	6=4x5	7	8=6+7
<b>B.</b>	<b>LABORATORY TESTING</b>						
B1	Sieve analysis	No.	450				
B2	Hydrometer analysis (with pretreatment)	No.	40				
B3	Liquid and plastic limits	No.	150				
B4	Bulk and dry density	No.	105				
B5	Natural Moisture Content (NMC)	No.	105				
B6	Consolidation with swell potential measurement	No.	35				
B7	Direct Shear (undisturbed samples)	No.	55				
B8	Unconfined Compression (on soil samples)	No.	50				
B9	Sulphate content	No.	40				
B10	Chloride content	No.	40				
B11	Organic matter content	No.	40				
B12	Complete chemical analysis of water samples i.e TDS, SO <sub>4</sub> , CL & pH	No.	65				
	<b>Sub-Total B =</b>						
	<b>Total (A+B)=</b>						
Total of Price Schedule Column 8 to be carried forward to Letter of Bid.							
<b>Name of Laboratory: <u>UET Lahore, SOILCON</u></b>							



Contract Document No. TLS-18-2024							
Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines for LOT-II							
LOT-II: 500kV Double Circuit (D/C) T/Line from Moro Substation to Rahim Yar Khan Substation (Approx. 335 km)							
GEOTECHNICAL INVESTIGATIONS							
BILL OF QUANTITIES							
Sr. No.	Description	Unit	Qty.	Unit Rate	Amount	PST	Total Price including PST
				PKR	PKR	PKR	PKR
1	2	3	4	5	6=4x5	7	8=6+7
A.	<b>FIELD INVESTIGATIONS</b>						
A1	Execution of: i) One hundred and fifty (150) boreholes up to maximum depth of 15 m, ii) Seventy (70) boreholes up to maximum depth of 20 m, iii) Ten (10) boreholes up to maximum depth of 25 in soils below existing ground level by straight rotary / heavy percussion method including backfilling of boreholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of borehole is 150 mm percussion method and 115 mm for straight rotary method for soil strata.	Lin.m	3550				
A2	Performance of Standard Penetration Tests (SPTs) in boreholes in soils generally at 1 to 1.5 m interval along with collection of SPT samples, including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	3300				
A3	Collection of relatively undisturbed soil samples from boreholes through Denison/ Pitcher/ Shelby sampler, including their waxing, labeling, packing, storage & transportation to an approved testing laboratory.	No.	230				
A4	Execution of augerholes of 10 m depth below NSL in soils by hand auger/light percussion method, for determination of water table, including backfilling of augerholes to their original position using cement sand-bentonite mix. Minimum permissible diameter of augerhole is 100 mm for hand auger/light percussion method for soil strata.	No.	60				
A5	Collection of water samples from boreholes (if encountered) including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	120				
A6	Preparation and submission of a comprehensive factual geotechnical investigation report (one hard copy) which shall include but not limited to: Description of the site, details of field investigation and laboratory testing, geotechnical investigation plan, borehole logs, subsurface soil profiles, summary of laboratory test results, laboratory test result sheets and photographs of site area and field activities. All the data shall also be provided in form of original soft files (word, excel, AutoCad etc).	LUMPSUM					
A7	Measure Soil resistivity at each borehole location along with resistivity survey.	No.	230				
	<b>Sub-Total A =</b>						
Total of Price Schedule Column 8 to be carried forward to Letter of Bid.							
<p>1. Mobilization and demobilization of at least Seven (07) straight rotary drilling/heavy percussion drilling rigs and one (01) hand auger/light percussion drilling set along with allied accessories at site including access to the site, setting-up and shifting from one investigation point to another is included in the scope of work. The equipment shall be adequate in quantity and performance to meet the time schedule.</p> <p>2. Establishment of coordinates and ground elevations of all the investigation points using total station / GPS is included in the scope of work.</p> <p>3. Preferred method of drilling will be straight rotary method. Percussion drilling will only be allowed in case of gravely strata/as approved by Engineer</p> <p>4. All the disturbed/undisturbed soil samples shall be stored and transported as per ASTM/BS or other relevant international standards. The area ratio and clearance ratio of the thin walled tube, should be in strict compliance with relevant ASTM standard.</p> <p>5. Payment shall be made as per actual quantity of work executed at site.</p> <p>6. The Contractor shall arrange transport for Engineer's supervisory staff for site duties (from hotel to drilling site, movement from point to point and back to hotel).</p>							

<b>Contract Document No. TLS-18-2024</b> <b>Detailed Survey &amp; Sub-Soil Investigation of 500 kV Transmission Lines for LOT-II</b> <b>LOT-II: 500kV Double Circuit (D/C) T/Line from Moro Substation to Rahim Yar Khan Substation (Approx. 335 km)</b>							
<b>GEOTECHNICAL INVESTIGATIONS</b>							
<b>BILL OF QUANTITIES</b>							
Sr. No.	Description	Unit	Qty.	Unit Rate	Amount	PST	Total Price including PST
				PKR	PKR	PKR	PKR
1	2	3	4	5	6=4x5	7	8=6+7
<b>B.</b>	<b>LABORATORY TESTING</b>						
B1	Sieve analysis	No.	1050				
B2	Hydrometer analysis (with pretreatment)	No.	75				
B3	Liquid and plastic limits	No.	350				
B4	Bulk and dry density	No.	226				
B5	Natural Moisture Content (NMC)	No.	226				
B6	Consolidation with swell potential measurement	No.	75				
B7	Direct Shear (undisturbed samples)	No.	115				
B8	Unconfined Compression (on soil samples)	No.	110				
B9	Sulphate content	No.	75				
B10	Chloride content	No.	75				
B11	Organic matter content	No.	75				
B12	Complete chemical analysis of water samples i.e TDS, SO <sub>4</sub> , CL & pH	No.	120				
	<b>Sub-Total B =</b>						
	<b>Total (A+B)=</b>						
Total of Price Schedule Column 8 to be carried forward to Letter of Bid.							
<b>Name of Laboratory: <u>UET Lahore, SOILCON</u></b>							