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 Matiari Convertor 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.	**FIELD INVESTIGATIONS**						
A1	Execution of: 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 orignal soft files (word, excel, AutoCad etc).	LUMPSUM					
A7	Measure Soil resistivity at each borehole location along with resistivity survey.	No.	110				
	Sub-Total A =						

Total of Price Schedule Column 8 to be carried forward to Letter of Bid.

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.

2. Establishment of coordinates and ground elevations of all the investigation points using total station / GPS is included in the scope of work.

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

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.

5. Payment shall be made as per actual quantity of work executed at site.

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).

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Lot-I: 500 kV Double Circuit (D/C) T/Line from Matiari Convertor 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
B.	**LABORATORY TESTING**						
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, SO4, CL & pH	No.	65				
	Sub-Total B =						
	Total (A+B)=						

Total of Price Schedule Column 8 to be carried forward to Letter of Bid.

Name of Laboratory: UET Lahore, SOILCON, DECON and Berkeley Associates

Contract Document No. TLS-18-2024
Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines for LOT-II

LOT-II: 500 kV 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.	**FIELD INVESTIGATIONS**						
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 orignal soft files (word, excel, AutoCad etc).	LUMPSUM					
A7	Measure Soil resistivity at each borehole location along with resistivity survey.	No.	230				
	Sub-Total A =						

Total of Price Schedule Column 8 to be carried forward to Letter of Bid.

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.

2. Establishment of coordinates and ground elevations of all the investigation points using total station / GPS is included in the scope of work.

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

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.

5. Payment shall be made as per actual quantity of work executed at site.

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).

Contract Document No. TLS-18-2024
Detailed Survey & Sub-Soil Investigation of 500 kV Transmission Lines for LOT-II

LOT-II: 500 kV 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
B.	**LABORATORY TESTING**						
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, SO4, CL & pH	No.	120				
	Sub-Total B =						
	Total (A+B)=						

Total of Price Schedule Column 8 to be carried forward to Letter of Bid.

Name of Laboratory: UET Lahore, SOILCON, DECON and Berkeley Associates