

CONSULTANCY SERVICES FOR 500 kV TRANSMISSION LINES INTERCONNECTION ARRANGEMENT FOR POWER EVACUATION FROM SUKI KINARI, KOHALA AND MAHL HYDRO POWER PROJECTS IN NORTHERN AREAS OF PAKISTAN, GEOTECHNICAL INVESTIGATION FROM MAIRA SWITCHING STATION TO LAHORE NORTH GRID STATION

GEOTECHNICAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
				PKR	PKR
A.	FIELD INVESTIGATIONS				
A1	Execution of Sixty (60) boreholes up to maximum depth of 15 m and Nine (09) boreholes up to maximum depth of 40 m below NSL in overburden soils or up to the bedrock, whichever is met earlier 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.	L.M.	1180		
A2	Continuous core drilling (NX Size) in bedrock up to a maximum depth of 8 m below rock strike level by using double tube core barrel, including extraction, preservation of core samples in core boxes, waxing, packing, photography of rock cores and transportation of core samples to the laboratory.	L.M.	80		
A3	Performance of Standard Penetration Tests (SPTs) in boreholes in overburden soils as well as in weathered rock generally at 1 m interval along with collection of SPT samples, including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	1100		
A4	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.	70		
A5	Excavation of ten (10) testpits up to maximum depth below NSL of 3.0 m at locations specified by the Engineer in overburden soils or up to the bedrock, whichever met earlier along with collection of disturbed samples, including their labelling, packing, storage & transportation to an approved testing laboratory, including backfilling of pits to their original condition.	L.M.	30		
A6	Performance of field density tests by sand replacement method in testpits at selected horizons, including determination of in-situ bulk and dry density and collection of small disturbed samples in moisture tins for moisture content determination in laboratory by oven drying method as well as labelling, packing, storage & transportation to an approved testing laboratory.	No.	6		
A7	Collection of undisturbed block samples (30 cm*30cm*30cm) from testpits including their waxing, labeling, packing, storage & transportation to an approved laboratory.	No.	5		
A8	Collection of water samples from borehole (if encountered) including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	20		
A9	Factual Geotechnical Investigation Report	Lump sum	1		
	Sub-Total A =				

1. Mobilization and demobilization of at least four (04) straight rotary drilling rigs 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. The coordinates should be provided with reference to a permanent bench mark established at site.

3. Preferred method of drilling will be straight rotary method. Percussion drilling will only be allowed in case of gravelly strata.

4. All the disturbed/undisturbed soil/rock 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. The Contractor shall arrange transport for Engineer's supervisory staff for site duties.

**CONSULTANCY SERVICES FOR 500 kV TRANSMISSION LINES INTERCONNECTION
ARRANGEMENT FOR POWER EVACUATION FROM SUKI KINARI, KOHALA AND
MAHL HYDRO POWER PROJECTS IN NORTHERN AREAS OF PAKISTAN,
GEOTECHNICAL INVESTIGATION FROM MAIRA SWITCHING STATION TO LAHORE
NORTH GRID STATION**

GEOTECHNICAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
				PKR	PKR
B.	LABORATORY TESTING				
B1	Sieve analysis	No.	300		
B2	Hydrometer analysis (with pretreatment)	No.	30		
B3	Liquid and plastic limits	No.	70		
B4	Bulk and dry density	No.	50		
B5	Consolidation with swell potential measurement	No.	20		
B6	Direct Shear (undisturbed samples)	No.	25		
B7	Unconfined Compression (on soil samples)	No.	30		
B8	Unconfined Compression (on rock samples)	No.	20		
B9	Point Load Index	No.	10		
B10	Sulphate content	No.	20		
B11	Chloride content	No.	20		
B12	Organic matter content	No.	20		
B13	Complete chemical analysis of water samples i.e. TDS, SO ₄ , CL & pH	No.	20		
	Sub-Total B =				
	Total (A+B)=				
Name of Laboratory: _____					