GEOTECHNICAL INVESTIGATIONS ALONG SUKI KINARI TO MAIRA TRANSMISSION LINE, PACKAGE-2 (KALAS, KOHALA TO MAIRA)

GEOTECHNICAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate PKR	Amount PKR
A.	**FIELD INVESTIGATIONS**				
A1	Mobilization and demobilization of atleast four (04) straight rotary/heavy percussion drilling rigs alongwith allied accessories at site including access to the site, setting-up and shifting from one investigation point to another. The equipment shall be adequate in quantity to meet the time schedule.	L.S.	Job		
A2	Execution of twenty five (25) boreholes upto maximum depth of 10 to 15 m below NSL in overburden soils or upto the bedrock, whichever is met earlier by straight rotary/heavy precussion method including backfilling of boreholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of borehole is 150 mm precussion method and 101 mm for straight rotary method for soil strata.	L.M.	200		
A3	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.	100		
A4	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 labelling, packing, storage & transportation to an approved testing laboratory.	No.	130		
A5	Collection of relatively undistrubed soil samples from boreholes through Denison/ Pitcher/ Shelby sampler, including their waxing, labelling, packing, storage & transportation to an approved testing laboratory.	No.	20		
A6	Excavation of forty five (45) 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.	100		
A7	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.	20		
A8	Collection of undistrubed block samples (30 cm*30cm*30cm) from testpits including their waxing, labelling, packing, storage & transportation to an approved laboratory.	No.	20		
A9	Collection of water samples from borehole (if encountered) including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	10		
	Sub-Total A =				

1. 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.

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

3. All the disturbed/undisturbed soil/rock samples shall be stored and transported as per ASTM/BS/ISRM 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.

4. Contractor shall ensure a minimum core recovery of 70 to 80 %. The drilling contractor shall be responsible for required recovery of rock core during coring process. In case of poor core recovery, a supplementary borehole shall be drilled by the Contractor without any extra cost.

5. The Contractor shall arrange transport for Engineer's supervisory staff for site duties.

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BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
				PKR	PKR
B.	**LABORATORY TESTING**				
B1	Sieve analysis	No.	60		
B2	Hydrometer analysis (with pretreatment)	No.	20		
B3	Liquid and plastic limits	No.	20		
B4	Bulk and dry density	No.	40		
B5	Consolidation with swell potential measurement	No.	15		
B6	Direct Shear (undisturbed samples)	No.	15		
B7	Direct Shear (Fully softened and residual φ)	No.	10		
B8	Unconfined Compression (on soil samples)	No.	30		
B9	Unconfined Compression (on rock samples)	No.	60		
B10	Point Load Index	No.	25		
B11	Sulphate content	No.	15		
B12	Chloride content	No.	15		
B13	Organic matter content	No.	15		
B14	Complete chemical analysis of water samples i.e TDS, SO4, CL & pH	No.	10		
	Sub-Total B =				
	Total (A+B)=				

Name of Laboratory: _____