CONSULTANCY SERVICES FOR MASTER PLANNING AND DETAILED DESIGNING FOR DEVELOPMENT OF BAHAWALPUR INDUSTRIAL ESTATE

GEOTECHNICAL INVESTIGATIONS
BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A.	**FIELD INVESTIGATIONS**				
A1	Mobilization and demobilization of atleast two (2) straight rotary/percussion drilling rigs and two (2) set of hand auger/light percussion drilling equipment alongwith allied accessories at site including 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: **i) Four** (4) boreholes up to a depth of 15 m at sewerage disposal station, **ii) Seven** (7) boreholes up to a depth of 20 m at seven overhead water tank locations, **iii) One** (1) borehole up to a depth of 15 m and **One** (1) borehole up to a depth of 10 m at mosque location, **iv) Four** (4) boreholes up to a depth of 15 m at one grid station, in overburden soils below NSL by straight rotary drilling method including backfilling of boreholes to their original position by cement:sand:bentonite mix.	L.M.	285		
A3	Execution of **Fifteen** (15) boreholes up to a depth of 10 m along sewerage line/route in overburden soils below NSL by hand auger/light percussion drilling method including backfilling of boreholes to their original position by cement:sand:bentonite mix.	L.M.	150		
A4	Performance of Standard Penetration Tests (SPTs) in boreholes along with collection of SPT samples at 1 m interval in general, or as necessary, including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	395		
A5	Collection of undistrubed soil samples from boreholes through Shelby/Denison/Pitcher samplers, including their waxing, labelling, packing, storage & transportation to an approved testing laboratory.	No.	40		
A6	Excavation of: **i) Fifteen** (15) testpits up to a depth of 1.5 m at road location **ii) Five** (5) testpits up to a depth of 3 m at structure locations below top of ground including backfilling of pits to original condition.	L.M.	37.5		
A7	Collection of undistrubed block samples (30 cm*30cm*30cm) from testpits including their waxing, labelling, packing, storage & transportation to an approved laboratory.	No.	5		
A8	Performance of field density tests by sand replacement method in testpits generally @ 1 to 2 tests/pit 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.	25		
A9	Collection of composite bulk soil samples from testpits including their labelling, packing, storage & transportation to an approved laboratory.	No.	15		
A10	Excavation of three (3) testpits up to the maximum depth of 2 m in borrow area below top of ground including backfilling of pits to original condition.	L.M.	6		
A11	Collection of borrow area samples (minimum weight 50-100 kg.) for embankment and subgrade material including their labelling, packing, storage & transportation to an approved laboratory.	No.	3		
A12	Performance of field permeability tests in boreholes at various depths using constant head or falling head methods for soil column/flush bottom conditions, as approporiate.	No.	5		
A13	Collection of water samples (if encountered) from boreholes/testpits including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	10		
	Sub-Total A	**Rs.**			

Establishment of coordinates and ground elevations of all the boreholes and testpits using **Total Station** are included in the scope of work. The coordinates should be provided with reference to a permanent local bench mark.

All soil samples must be labelled, stored and transported as per ASTM. The area ratio and clearance ratio of the thin walled tube, should be in strict compliance with relevant ASTM standard.

The preferred method of drilling is straight rotary. Percussion boring will be allowed only in case of presence of excessive cobbles/boulders in the substrata.

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BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
B.	**LABORATORY TESTING**			(Rs.)	(Rs.)
B1	Sieve analysis	No.	100		
B2	Hydrometer analysis	No.	25		
B3	Liquid and plastic limits	No.	40		
B4	Bulk density & dry density	No.	40		
B5	Consolidation with Swell Potential Measurements	No.	10		
B6	Direct Shear	No.	30		
B7	Unconfined Compression	No.	20		
B8	Modified AASHTO Compaction	No.	15		
B9	3-Point Soaked CBR	No.	15		
B10	Sulphate content of soil	No.	10		
B11	Chloride content of soil	No.	10		
B12	Organic matter content of soil	No.	10		
B13	Complete chemical analysis of water samples i/c TDS, Cl, SO4 & pH	No.	10		
	Sub- Total B			**Rs.**	

Name of Laboratory:

Total (A+B)=	**Rs.**	