

**MASTER PLANNING, DETAILED ENGINEERING DESIGN AND RESIDENT SUPERVISION OF INFRASTRUCTURE
DEVELOPMENT OF JALOZAI ECONOMIC ZONE, NOWSHERA**

**GEOTECHNICAL INVESTIGATIONS
BILL OF QUANTITIES**

Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A.	FIELD INVESTIGATIONS				
A1	Mobilization and demobilization of atleast three (3) straight rotary/percussion drilling rigs 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 one sewerage disposal station, ii) Four (4) boreholes up to a depth of 15 m at four overhead water tank locations, iii) Six (6) boreholes up to a depth of 6 m along the boundary wall, iv) Four (4) boreholes up to a depth of 15 m at one grid station, v) Ten (10) boreholes up to a depth of 8 m along the sewer line/route, vi) Two (2) boreholes up to a depth of 15 m at Hydraulic Structure 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.	326		
A3	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.	301		
A4	Collection of undisturbed soil samples from boreholes through Shelby/Denison/Pitcher samplers, including their waxing, labelling, packing, storage & transportation to an approved testing laboratory.	No.	25		
A5	Excavation of: i) Ten (10) 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.	30		
A6	Collection of undisturbed block samples (30 cm*30cm*30cm) from testpits including their waxing, labelling, packing, storage & transportation to an approved laboratory.	No.	5		
A7	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.	20		
A8	Collection of composite bulk soil samples from testpits including their labelling, packing, storage & transportation to an approved laboratory.	No.	10		
A9	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		
A10	Collection of borrow area samples (minimum weight 50-100 kg.) for the construction of embankment, subgrade and flood protection bund including their labelling, packing, storage & transportation to an approved laboratory.	No.	3		
A11	Performance of field permeability tests in boreholes at various depths using constant head or falling head methods for soil column/flush bottom conditions, as appropriate.	No.	5		
A12	Collection of water samples (if encountered) from boreholes/testpits including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	8		
	Sub-Total A	Rs.			
<p>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.</p> <p>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.</p> <p>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.</p>					

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Sr. No.	Description	Unit	Qty.	Rate	Amount
B.	LABORATORY TESTING			(Rs.)	(Rs.)
B1	Sieve analysis	No.	70		
B2	Hydrometer analysis	No.	20		
B3	Liquid and plastic limits	No.	40		
B4	Bulk density & dry density	No.	40		
B5	Consolidation with Swell Potential Measurements	No.	5		
B6	Direct Shear	No.	20		
B7	Unconfined Compression	No.	15		
B8	Modified AASHTO Compaction	No.	15		
B9	3-Point Soaked CBR	No.	15		
B10	Sulphate content of soil	No.	8		
B11	Chloride content of soil	No.	8		
B12	Organic matter content of soil	No.	8		
B13	Complete chemical analysis of water samples i/c TDS, Cl, SO4 & pH	No.	8		
Sub- Total B				Rs.	

Name of Laboratory:

Total (A+B)=

Rs.	
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