FEASIBILITY STUDY FOR URBAN ROAD PROJECTS, KARACHI

(Package - 1: Link Road for Korangi & Interchange at ICI Bridge)

GEOTECHNICAL INVESTIGATIONS
BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A.	**FIELD INVESTIGATIONS**				
A1	***A1-1:*** Mobilization and demobilization of at least ***Three (03)*** straight rotary/heavy percussion drilling rigs at site including setting-up & shifting from one investigation point to another. The equipment should be sufficient to meet the time schedule. Minimum permissible diameter of borehole is 300 mm for percussion method and 101 mm for straight rotary method.	L.S.	Job		
	A-1-2: Mobilization and demobilization of at least one pontoon / barge assembly, complete in all respects, including setting-up and shifting from one investigation point to another.	L.S.	Job		
A2	Execution of: ***i) Two (02)*** boreholes up to a maximum depth of 40 m for Interchange at ICI Bridge ***ii) Eight (08)*** borehole of 20 - 40 m depth for Korangi Link Roads in overburden soils below NSL or up to rock strike level, whichever is met earlier, by straight rotary/heavy percussion drilling method including backfilling of boreholes to their original position by cement-sand-bentonite mix.	L.M.	280		
A3	Execution of ***Two (02)*** boreholes for Korangi Link Roads using pontoon/barge assembly up to the maximum depth of 40 m below Sea Bed Level in overburden soils or up to rock strike level, whichever is met earlier, by straight rotary drilling method including backfilling of boreholes to their original position by cement-sand-bentonite slurry.	L.M.	60		
A4	Continuous core drilling (NX size in general) in bedrock up to a minimum depth of 3 m below rock strike level, including preservation of core samples in core boxes, waxing of core samples, photography of rock cores and transportation of core samples to the laboratory.	L.M.	70		
A5	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.	315		
A6	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.	25		
A7	Excavation of ***Fifteen (15)*** testpits up to a maximum depth of 2 m or up-to subgrade, whichever is met earlier, exposing of road/pavement layers and backfilling of pits to original condition including construction of 1 ft thick P.C.C. (1:2:4) pad at top of each pit for level surfacing.	L.M.	30		
A8	Performance of field density tests by sand replacement method in testpits generally @ 2-3 tests/pit at selected horizons in existing pavement layers (i.e. in Water Bound Mecadam/ Aggregate Base Course, Sub-Base and Sub-grade), 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.	40		
A9	Collection of composite bulk samples (from Water Bound Mecadam/ Aggregate Base Course, Sub-Base and Sub-grade) from ten (10) testpits including their labelling, packing, storage & transportation to an approved laboratory.	No.	15		
A11	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.**			

Establishment of coordinates and ground elevations of all the boreholes & 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 / rock / water samples shall be stored and tranported as per ASTM standards. The area and clearance ratio of the sampling tubes should be as per ASTM requirements.

Contractor will be responsible for arrangement of Personnel Protective Equipments (PPEs) such as safety helmets and jackets for NESPAK site supervisory / visiting staff.

Straight rotary drilling method will be used for execution of borehole in sandy / clayey soil and in bedrock. However, percussion method of boring will be required if gravelly strata encountered

FEASIBILITY STUDY FOR URBAN ROAD PROJECTS, KARACHI

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GEOTECHNICAL INVESTIGATIONS
BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
B.	**LABORATORY TESTING**			(Rs.)	(Rs.)
B1	Sieve analysis	No.	80		
B2	Hydrometer analysis	No.	20		
B3	Liquid & plastic limits	No.	25		
B4	Bulk & Dry density	No.	30		
B5	Natural Moisture Content (NMC)	No.	20		
B6	Consolidation with Swell Potential Measurements	No.	5		
B7	Direct Shear (Soil Sample)	No.	10		
B8	Unconfined Compression (Soil Sample)	No.	10		
B9	Uniaxial Compression (Rock Sample)	No.	20		
B10	Point Load Index	No.	10		
B11	Modified AASHTO Compaction	No.	15		
B12	3-Point Soaked CBR	No.	15		
B13	Sulphate content of soil	No.	8		
B14	Chloride content of soil	No.	8		
B15	Organic matter content of soil	No.	8		
B16	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.**	

FEASIBILITY STUDY FOR URBAN ROAD PROJECTS, KARACHI

(Package - 2: Expressway from Mauripur Road to Y-Junction)

GEOTECHNICAL INVESTIGATIONS
BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A.	**FIELD INVESTIGATIONS**				
A1	***A1-1:*** Mobilization and demobilization of at least ***Two (02)*** straight rotary/heavy percussion drilling rigs at site including setting-up & shifting from one investigation point to another. The equipment should be sufficient to meet the time schedule. Minimum permissible diameter of borehole is 300 mm for percussion method and 101 mm for straight rotary method.	L.S.	Job		
	A-1-2: Mobilization and demobilization of pontoon / barge assembly, complete in all respects, including setting-up and shifting from one investigation point to another.	L.S.	Job		
A2	Execution of ***Seven (07)*** boreholes of depth 20 - 30 m in overburden soils below NSL or up to rock strike level, whichever is met earlier, by straight rotary/heavy percussion drilling method including backfilling of boreholes to their original position by cement-sand-bentonite mix.	L.M.	170		
A3	Execution of ***Two (02)*** boreholes using pontoon/barge assembly up to the maximum depth of 30 m below Sea Bed Level in overburden soils or up to rock strike level, whichever is met earlier, by straight rotary drilling method including backfilling of boreholes to their original position by cement-sand-bentonite slurry.	L.M.	50		
A4	Continuous core drilling (NX size in general) in bedrock up to a minimum depth of 3 m below rock strike level, including preservation of core samples in core boxes, waxing of core samples, photography of rock cores and transportation of core samples to the laboratory.	L.M.	40		
A5	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.	200		
A6	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.	20		
A7	Excavation of ***Fifteen (15)*** testpits up to a maximum depth of 2 m or up-to subgrade, whichever is met earlier, exposing of road/pavement layers and backfilling of pits to original condition including construction of 1 ft thick P.C.C. (1:2:4) pad at top of each pit for level surfacing.	L.M.	30		
A8	Performance of field density tests by sand replacement method in testpits generally @ 2-3 tests/pit at selected horizons in existing pavement layers (i.e. in Water Bound Mecadam/ Aggregate Base Course, Sub-Base and Sub-grade), 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.	40		
A9	Collection of composite bulk samples (from Water Bound Mecadam/ Aggregate Base Course, Sub-Base and Sub-grade) from ten (10) testpits including their labelling, packing, storage & transportation to an approved laboratory.	No.	15		
A11	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.**			

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B14	Chloride content of soil	No.	8		
B15	Organic matter content of soil	No.	8		
B16	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.**	