

CHAPTER 31 : SUB-SOIL INVESTIGATION WORKS & DIGITAL SURVEY						
Item No.	Description of Item	Unit	Unit Rate (Dhaka, Mymensingh)	Unit Rate (Chattogram, Sylhet)	Unit Rate (Khulna, Barisal, Gopalganj)	Unit Rate (Rajshahi, Rangpur)
Percussion Method of Drilling						
31.1	Mobilization and demobilization of boring equipment and man-power: at site (drilling rig comprising drilling pipe, drop hammer, tripod, pulley, chain, wrange, sample collection devices etc tools and plants; tripod for temporary camp, necessary work-force etc) (Once for one site)	per site	Tk. 14,702.00	Tk. 14,585.00	Tk. 14,252.00	Tk. 14,252.00
31.2	Sub - Soil investigation by 100 mm dia percussion wash boring including collecting disturbed and undisturbed soil samples in numbers as required for classification of soil, conducting SPT using auto trip hammer, stratification of layers, analysing physical parameters of soils like Atterberg limits, specific gravity, gain size distribution(by wet seive, hydrometer if required) , ground water table location, direct shear test, unconfined compression test, unit weight(dry/weight), natural moisture content ; C - ϕ values and other strength parameters to ascertain bearing capacity , skin friction, end bearings etc at every 1.5m interval as per respective national/international standards and entering all these data & information in necessary tables & graphs and finally furnishing them in the form of standard sub-soil investigation report with CD containing video of sub-soil investigation operation of concerned site duly signed by competent engineer & exploratory office.					
31.2.1	Bore hole depth from 0 to 20 m	per bore hole	Tk. 33,871.00	Tk. 33,722.00	Tk. 33,259.00	Tk. 33,259.00
31.2.2	Additional charge for bore hole depth above 20.0 m and upto 30.0 m	meter	Tk. 495.00	Tk. 491.00	Tk. 480.00	Tk. 480.00
31.2.3	Additional charge for bore hole depth above 30.0 m and upto 40.0 m	meter	Tk. 540.00	Tk. 535.00	Tk. 523.00	Tk. 523.00
31.2.4	Additional charge for bore hole depth above 40.0 m and upto 50.0 m	meter	Tk. 570.00	Tk. 565.00	Tk. 553.00	Tk. 553.00
31.3	Sub-soil investigation by 100 mm dia wash boring including collecting disturbed and undisturbed soil samples in numbers as required for classification of soil, conducting SPT using auto trip hammer, stratification of layers, and entering all these data & information in necessary tables & graphs, furnishing them in the form of standard sub-soil investigation report duly signed by competent engineer & exploratory office.(Only after written advice from concerned design division/circle)					
31.3.1	Bore hole depth from 0 to 20m	per bore hole	Tk. 9,300.00	Tk. 9,226.00	Tk. 9,042.00	Tk. 9,042.00
31.3.2	Additional charge for bore hole depth above 20.0 m and upto 30.0 m	meter	Tk. 408.00	Tk. 404.00	Tk. 394.00	Tk. 394.00
31.3.3	Additional charge for bore hole depth above 30.0 m and upto 40.0 m	meter	Tk. 453.00	Tk. 448.00	Tk. 437.00	Tk. 437.00
31.3.4	Additional charge for bore hole depth above 40.0 m and upto 50.0 m	meter	Tk. 482.00	Tk. 477.00	Tk. 466.00	Tk. 466.00
31.4	Added cost per bore hole, if the same is under water by more than 1.5 m in depth	per bore hole	Tk. 6,954.00	Tk. 6,903.00	Tk. 6,643.00	Tk. 6,643.00
Rotary Method of Drilling						
31.5	Mobilization and demobilization of boring equipment and man-power: at site (rotary hydraulic drilling rig comprising mud pump, drilling pipe, auto trip hammer, pulley, chain, wrange, sample collection devices (shelby tube, split spoon sampler) etc tools and plants; tripod for temporary camp, necessary work-force etc) (Once for one site) (Only after written advice from concerned design division/circle)	per site	Tk. 25,785.00	Tk. 25,785.00	Tk. 25,785.00	Tk. 25,785.00

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Item No.	Description of Item	Unit	Unit Rate (Dhaka, Mymensingh)	Unit Rate (Chattogram, Sylhet)	Unit Rate (Khulna, Barisal, Gopalgonj)	Unit Rate (Rajshahi, Rangpur)
31.6	Sub - Soil investigation by 100 mm dia rotary wash boring and including collecting disturbed and undisturbed soil samples in numbers as required for classification of soil, conducting SPT using auto trip hammer, stratification of layers, analysing physical parameters of soils like Atterberg limits, specific gravity, grain size distribution (by wet sieve, hydrometer if required) . ground water table location, direct shear test, unconfined compression test, unit weight (dry/weight), natural moisture content ; C - ϕ values and other strength parameters to ascertain bearing capacity . skin friction, end bearings etc at every 1.5m interval as per respective national/international standards and entering all these data & information in necessary tables & graphs and finally furnishing them in the form of standard sub-soil investigation report with CD containing video of sub-soil investigation operation of concerned site duly signed by competent engineer & exploratory office. (Only after written advice from concerned design division/circle)					
31.6.1	Bore hole depth from 0 to 20 m	per bore hole	Tk. 52,846.00	Tk. 52,846.00	Tk. 52,846.00	Tk. 52,846.00
31.6.2	Additional charge for bore hole depth above 20.0 m and upto 30.0 m	meter	Tk. 900.00	Tk. 900.00	Tk. 900.00	Tk. 900.00
31.6.3	Additional charge for bore hole depth above 30.0 m and upto 40.0 m	meter	Tk. 1,028.00	Tk. 1,028.00	Tk. 1,028.00	Tk. 1,028.00
31.6.4	Additional charge for bore hole depth above 40.0 m and upto 50.0 m	meter	Tk. 1,159.00	Tk. 1,159.00	Tk. 1,159.00	Tk. 1,159.00
Downhole Siesmic Testing						
31.7	Mobilization of downhole siesmic testing equipments such as a hammer weighing 10lb, a wooden Beam of L= 2.40m and B & t = 150mm, Receiver borehole pick with 3D geophones to measure the velocity and travel time of P and S wave inside the borehole and 2nos. 1D Geophone to measure surface velocity of P and S wave. Trigger: Sending signal to control unit to record First Arrival Time (FAT) and velocity of P and S wave. Control and Processing Unit with Laptop (Only after written advice from concerned design division/circle)	per test	Tk. 9,734.00	Tk. 9,734.00	Tk. 9,734.00	Tk. 9,734.00
31.8	Downhole Siesmic Testing- The test is to be conducted in accordance to ASTM D7400-08 to determine the interval velocities (VS & VP) from arrival times of compression (P) and shear (S) seismic waves which are generated near surface and travel down to an array of vertically installed seismic sensors. This item includes the necessary cost for entering all these data & information in necessary tables & graphs and finally furnishing them in the form of standard sub-soil investigation report with CD containing video of sub-soil investigation operation of concerned site duly signed by competent engineer & exploratory office. (Only after written advice from concerned design division/circle)					
31.8.1	For first test	per test	Tk. 125,541.00	Tk. 125,541.00	Tk. 125,541.00	Tk. 125,541.00
31.8.2	For each consecutive test after first test	per test	Tk. 113,283.00	Tk. 113,283.00	Tk. 113,283.00	Tk. 113,283.00

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31.9	Conducting plate load test as per ASTM D1194 or equivalent standard providing required arrangement of three circular steel plates with minimum thickness of 25 mm and varying in diameter from 305 mm to 762 mm respectively or square steel bearing plates of equivalent area for minimum 50 tons loading capacity of hydraulic or mechanical jack assembly and applying load in 2 cycles with maintaining time interval of each loading increment of not less than 15 minutes. Continue each test until a peak load is reached or until the ratio of load increment to settlement increment reaches a minimum, steady magnitude. If sufficient load is available, continue the test until the total settlement reaches at least 10 percent of the plate diameter, unless a well defined failure load is observed and all other required materials, excavation, protection against collapse, preparation of test pit, calibration of hydraulic jacks with pressure guage (with an error not exceeding $\pm 2\%$ of the load increment used) & dial gauges (an accd design division/circle)tc. as per requirement all complete, approved and accepted by the Engineer-in-charge. (All the welding joints must be TIG welded)(Rate is excluding the cost of shed, perimeter fencing and RCC floor).: a) manufacturer's name and/or registered trademark, b) the number of Bangladesh standard and c) country of origin. Each product shall also be marked with the BSTI Certification Mark. The fixure should be placed in position fitted and fixed with heavy type C.I. brackets, 12 mm dia C.P. bib cock, 40 mm dia C.P. chain plug, 40 mm dia. C.P. waste, 32 mm dia PVC waste pipe with brass coupling (750 mm length) including making holes in walls and floors and mending good the damages with cement mortar (1:4) etc. all complete approved and	per test	Tk. 90,549.00	Tk. 90,288.00	Tk. 88,908.00	Tk. 88,908.00
31.9.1	Per test rate for conducting additional plate load test at the same site after first 03(Three) tests.	per test	Tk. 28,520.00	Tk. 28,222.00	Tk. 27,101.00	Tk. 27,101.00
31.9.2	Additional charge per km (beyond 25 Km) outside Dhaka city (two ways)/any city for mobilization & demobilization	per km	Tk. 193.00	Tk. 193.00	Tk. 193.00	Tk. 193.00
31.10	Carrying out different tests on soil samples in BUET laboratory collected from the sub-soil investigation site accepted by the Engineer-in-Charge. (Only after written advice from concern design division/circle)					
31.10.1	Void ratio	per set of test	Tk. 7,700.00	Tk. 7,700.00	Tk. 7,700.00	Tk. 7,700.00
31.10.2	Organic matter content	per set of test	Tk. 4,500.00	Tk. 4,500.00	Tk. 4,500.00	Tk. 4,500.00
31.10.3	Permeability for cohesive soil	per set of test	Tk. 24,000.00	Tk. 24,000.00	Tk. 24,000.00	Tk. 24,000.00
31.10.4	Permeability non-cohesive soil	per set of test	Tk. 9,500.00	Tk. 9,500.00	Tk. 9,500.00	Tk. 9,500.00
31.10.5	Consolidation test for cohesive soil	per set of test	Tk. 24,000.00	Tk. 24,000.00	Tk. 24,000.00	Tk. 24,000.00
31.10.6	Triaxial shear Test					
31.10.6.1	Consolidated undrained triaxial test with pore pressure for cohesive and non co-hesive soil	per set of test	Tk. 52,000.00	Tk. 52,000.00	Tk. 52,000.00	Tk. 52,000.00
31.10.6.2	Consolidated undrained triaxial test without pore pressure for cohesive soil	per set of test	Tk. 46,000.00	Tk. 46,000.00	Tk. 46,000.00	Tk. 46,000.00
31.10.6.3	Consolidated drained triaxial test	per set of test	Tk. 52,000.00	Tk. 52,000.00	Tk. 52,000.00	Tk. 52,000.00
31.10.6.4	Unconsolidated undrained triaxial test without pore pressure	per set of test	Tk. 24,000.00	Tk. 24,000.00	Tk. 24,000.00	Tk. 24,000.00
31.10.7	One dimensional swelling / settlement potential of cohesive soil.	per set of test	Tk. 10,000.00	Tk. 10,000.00	Tk. 10,000.00	Tk. 10,000.00
31.10.8	Modified proctor compaction test	per set of test	Tk. 20,000.00	Tk. 20,000.00	Tk. 20,000.00	Tk. 20,000.00
	Detail digital topographic & physical feature survey					

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Item No.	Description of Item	Unit	Unit Rate (Dhaka, Mymensingh)	Unit Rate (Chattogram, Sylhet)	Unit Rate (Khulna, Barisal, Gopalgonj)	Unit Rate (Rajshahi, Rangpur)
31.11.1	Mobilization and demobilization of survey equipment and man-power: survey equipment comprising Total Station, RTK-GPS, level machine, Prism with stand, Tripod and others necessary tools & plants, triple for temporary camp and necessary work-force.	per site	Tk. 11,390.00	Tk. 11,390.00	Tk. 11,257.00	Tk. 11,257.00
31.11.2	Detail digital topographic & physical feature survey of project area. The survey will cover the location and alignment of all topographic features inside the project area such as: Boundary, roads, exposed surface drains, walk ways, existing physical features such as trees, structures, exposed utility network etc. Spot land levels of the project area will be surveyed for contouring@ 5 m C/C. GPS should be used for establishing co-ordinate of global axis-Latitude/Longitude. Total station should be used for survey of spot level, detailed physical features etc. Field data shall be processed in GIS or Auto CAD Software. Finally layout map with all topographic and physical features shall be prepared using Auto CAD Software. All data & maps should be Submitted both in hard and soft format in 5(five) copy.	per Acre	Tk. 14,955.00	Tk. 16,291.00	Tk. 16,157.00	Tk. 16,157.00
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