

BHEL: PS WR
TS NO : BHE/PW/PUR/RATE -CONTRCT-GEO/692
PRICE BID-PART-II (VOL-III)

RATE CONTRACT FOR GEO- TECHNICAL INVESTIGATION AND TOPOGRAPHICAL SURVEY FOR VARIOUS FORTH-COMING POWER PROJECTS IN INDIA AT MADHYAPRADESH, CHHATTISGARH, MAHARASTRA, GUJARAT ,GOA , AND ALSO SITES ON BORDER OF UP & RAJASTAN STATE WITHIN BHEL POWER SECTOR WESTERN REGION

SL. No.	ITEM DESCRIPTION	UNIT	QTY.	ESTIMATED RATE & AMOUNT	
				RATE IN RS	AMOUNT IN RS
	SECTION A - TOPOGRAPHICAL SURVEY				
1	Carrying out bench mark from the nearest GTS bench mark or any other available source as approved by the engineer-in-charge to different locations in the project area including clearing of jungles and/or cutting trees and any other works required for completion of the said item etc all complete as per specification and instructions of the engineer-in-charge. (Construction of bench mark pillar to be paid separately)	km	3	2500	7500
2	Carrying out topographical survey of plant and allied areas showing all permanent & general features and detailed contour survey by taking spot levels at 25m interval, carrying out cross section of canal/nallah by taking spot levels at 5m interval or less including clearance of jungles and cutting of trees etc which are interfering with the survey works and any other field works necessary for the completion of the said item, preparation and submission of all plans (maps), reports, floppy and originals etc all complete as per specification and instructions of the engineer-in-charge.	Hectare	9	2500	22500
3	Construction of bench mark pillar/reference pillar/grid pillar at different locations including clearing of jungles, excavation, supply of materials, pillar marking, backfilling, white washing, painting on MS plate etc all complete as per specification, drawings and instructions of the engineer-in- charge.				
	a) Bench mark pillar	Each	2	4900	9800
	b) Grid/reference pillar	Each	20	2744	54880
	TOTAL OF SECTION-A				94680.00
	SECTION B - SOIL INVESTIGATION				

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1	Mobilisation of necessary equipments , men and materials to the project site for carrying out the geotechnical investigation and demobilisation of the same after completion of all the field works etc all complete as per specification, drawings and as directed by the engineer-in-charge. 1 (One Set) comprising of minimum indicative list of equipment to be deployed as per Appendix - I of Tender Specification. Any additional equipments if required shall be mobilized as per the directions of the BHEL Engineer to match the work schedule without extra cost	LS	1	150000	150000
2(a)	Making 150mm nominal diameter bore hole at various locations upto a maximum depth of 10m below ground level in all types of soil including laterite using suitable approved method of boring including chiselling, cleaning, providing casing pipes as required or as directed; performing standard penetration test at every 2m interval down to 10m depth below ground level and at every 3m interval beyond 10m depth, at change of strata and at depths wherever undisturbed soil samples could not be collected; collection of undisturbed soil samples at every 2m interval down to 10m depth below ground level and at every 3m interval beyond 10m depth and at change of strata; collection of disturbed soil samples and water samples, sealing and packing of samples, observation such as ground water table etc; transportation of all the collected samples to the laboratory and back filling of boreholes with sand on completion of the same etc all complete as per specification and as directed by the engineer-in-charge.	RM	300	675	202500
2(b)	Core drilling (Nx size) in rock up to a maximum of 25m depth below ground level using hydraulic feed rotary drill and double tube core barrel with diamond bit including collection of core samples, performing SPT at locations where core recovery is less than 20%, maintaining continuous record of core recovery and RQD, keeping the cores in wooden core boxes, transporting the cores to laboratory, back filling the holes with 1 part of cement : 3 part of sand grout on completion of the same etc all complete as per specification, drawings and as directed by the engineer-in-charge.	RM	450	1323	595350

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3	Excavating trial pit (TP) of size 3m x 3m at various locations upto 4m depth below ground level in all types of soil and weathered rock which can be excavated with pick axe/crow bar etc including sheeting or shoring the sides for the purpose of stability, dewatering and maintaining the pit dry at all times, collecting disturbed/undisturbed samples at 1m interval and at final depth and transporting all the collected samples to the laboratory; backfilling of the pit with excavated material etc all complete as per specification and as directed by the engineer-in-charge.	CuM	144	75	10800
4	Conducting plate load test (PLT) in various locations at specified depth complete as per specification, drawings and as directed by the engineer-in-charge. Payment for making the pit of suitable size, maintaining it dry and backfilling etc shall be paid separately as per item no.3	Each	3	19000	57000
5	Conducting cyclic plate load test (CPLT) in various locations at specified depth complete as per specification, drawings and as directed by the engineer-in-charge. Payment for making the pit of suitable size, maintaining it dry and backfilling etc shall be paid separately as per item no.3	Each	4	21000	84000
6	Conducting cross hole shear wave test (CHSWT) in bore hole in all types of strata at all depths such as 2m, 4m, 6m, 8m, 10m, 13m, 16m, 19m, 22m, 25m, 28m, 31m, 34m, 37m & 40m below ground level including preparation of borehole, providing PVC liner, grouting and backfilling with sand after completion of the test etc all complete as per specification, drawings and as directed by the engineer-in-charge. Cost of the borehole and backfilling etc shall be paid separately as per item no.2a & 2b above.	Each	6	170000	1020000
7	Performing dynamic cone penetration test (DCPT) at various locations using 65mm cone with circulation of bentonite slurry etc all complete as per specification, drawings and as directed by the engineer-in-charge.	Each	10	1500	15000
8	Performing static cone penetration test (SPT) at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	Each	10	12000	120000

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9	Conducting field vane shear test (FVST) in various locations at specified depth including collection of disturbed soil sample etc all complete as per specification, drawings and as directed by the engineer-in-charge.	Each	5	500	2500
10	Conducting electrical resistivity test (ERT) at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	Each	35	2200	77000
11(a)	Conducting pump in type field permeability test (FPT) by constant head or falling head method (suitability of type of test shall be as per site conditions) in various boreholes at specified depth including providing packers as required etc all complete as per specification, drawings and as directed by the engineer-in-charge. Cost of the borehole and backfilling etc shall be paid separately as per item no.2a & 2b above.	Each	2	980	1960
11(b)	Conducting field permeability test in boreholes for rocky stratum at specified depth by double packer method complete as per specification, drawings and as directed by the engineer-in-charge. Cost of the borehole and backfilling etc shall be paid separately as per item no.2a & 2b above.				
	a)Double packer method	Each	2	2000	4000
12	Conducting pressuremeter test (PMT) in various bore holes in all types of strata at all depths such as 2m, 5m, 8m, 11m, 14m, 17m, 20m, 23m, 26m, 29m, 32m, 35m, 38m & 40m below ground level including preparation of bore hole of required size etc all complete as per specification, drawings and as directed by the engineer-in-charge. Cost of the borehole and backfilling etc shall be paid separately as per item no.2a & 2b above.	Each	5	39200	196000
13	Conducting seismic refraction test (SRT) at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	RM	1000	323.4	323400
14(a)	Conducting Laboratory Test on soil samples at an approved laboratory including preparation of soil samples to determine the following properties etc all complete as per specification.				
	a)Bulk density and moisture content	Each	50	50	2500
	b)Sieve analysis	Each	100	50	5000
	c)Hydrometer analysis	Each	30	50	1500

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	d)Liquid limit and plastic limit	Each	100	50	5000
	e)Shrinkage limit	Each	30	50	1500
	f)Specific gravity	Each	30	50	1500
	g) Swell pressure	Each	30	150	4500
	h) Free swell index	Each	30	75	2250
	i) Relative density	Each	30	75	2250
	j) Unconfined compressive strength	Each	50	150	7500
	k) Direct shear test	Each	100	147	14700
	l) Box shear test	Each	50	196	9800
	m) Triaxial shear test				
	i)unconsolidated undrained test	Each	50	100	5000
	(ii) Consolidated undrained test with the measurement of pore water pressure	Each	50	300	15000
	(iii) Consolidated drained	Each	50	300	15000
	n) One dimensional consolidation test	Each	50	294	14700
	o) Standard Proctor compaction test	Each	10	600	6000
	p) CBR test at				0
	(i) soaked condition	Each	10	750	7500
	(ii) un-soaked conditions	Each	10	700	7000
	q) Chemical analysis	Each	10	300	3000
14(b)	Conducting Laboratory Test on rock samples including preparation of the samples to determine the following properties etc all complete as per specification.				
	a)Moisture content, porosity & density	Each	50	100	5000
	b)Specific gravity, Hardness	Each	30	100	3000
	c)Slake durability index	Each	30	250	7500
	d)Unconfined compressive strength (both at saturated and in-situ water content)	Each	75	392	29400
	e)Point load strength	Each	30	392	11760
	f) Deformability test (Saturated & Dry sample)	Each	30	400	12000

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15	Conducting chemical test on water samples to determine the carbonate, sulphate, chloride and nitrate contents, pH value, turbidity, organic matter and any other chemicals harmful to foundation material etc all complete as per specification.	Each	10	500	5000
16	Conducting chemical test on 2:1 water : soil extract to determine the carbonate, sulphate, chloride and nitrate contents, pH value, turbidity, organic matter and any other chemicals harmful to foundation material etc all complete as per specification.	Each	10	500	5000
17	Preparation and submission of draft report in 3 copies and final report in 5 hard copies and 2 soft copies on 3½” floppies after the approval of draft report including all field records, laboratory test results, graphs, analysis of test results and recommendation etc all complete as per specification.	LS	1	35000	35000
	TOTAL OF SECTION-B				3104370
	TOTAL OF SECTION A & SECTION-B IN RS				3199050.00
	BIDDER'S TO QUOTE PRICE IN TERMS OF (+/-) PERCENTAGE OF THE ABOVE ESTIMATED COST			(+)	%
				OR (-)	%
NOTES:					
1	This percentage variation shall remain constant & shall be applied on all the above BOQ item rates.				
2	The above quantity is tentative & liable to vary as per site requirement for different rating of project. Payment shall be made as per the actual quantiy executed at site.				