

TENDER SPECIFICATION

NO: BHE/PW/PUR/KHARGONE-GEO/1324

**GEO- TECHNICAL INVESTIGATION AND TOPOGRAPHICAL
SURVEY**

AT

2X660 MW NTPC KHARGAON STPP

IN

MADHYA PRADESH

**VOLUME-II-PRICE BID SPECIFICATION
(SECTION-A: TOPOGRAPHICAL SURVEY
AND SECTION-B: GEO TECHNICAL
INVESTIGATION)**



BHARAT HEAVY ELECTRICALS LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING)

POWER SECTOR - WESTERN REGION

SHREEMOHINI COMPLEX

345, KINGSWAY - NAGPUR 440 001

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(A GOVERNMENT OF INDIA UNDERTAKING)

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AT

2X660 MW NTPC KHARGAON STPP

IN

MADHYA PRADESH

EARNEST MONEY DEPOSIT: Please see Notice Inviting Tender.

LAST DATE FOR: Please see Notice Inviting Tender.

TENDER SUBMISSION:

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING **VOLUME-I-Tech Bid**, Vol-I-E-Statnderd Tech Specs, **VOLUME- II-Price Bid** AND VOLIME-IBCD Rev ARE ISSUED TO:

M/s.

PLEASE NOTE:

THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

AGM (Purchase)

Place: Nagpur

Date:

BHEL PSWR
T. S. No. BHE/PW/PUR/KHARGONE-GEO/1324
Vol-II-Price Bid
Section A: SCHEDULE OF QUANTITIES FOR TOPOGRAPHICAL SURVEY

NOTES:

1. The item of work in the schedule of quantities describes the work very briefly. Details of items shall be read in conjunction with the corresponding specification, drawings and other tender terms. For each item in the schedule of quantities, the bidder's rate shall include all the activities covered in the description of the items as well as for all necessary operations in detail described in the technical specification.
2. The bidder shall quote for finished items of work and shall provide all necessary power, water, instruments, fuel, tools and plants, tackles, materials, transport, labour, supervision and maintenance till handing over, repairs, rectifications, safety and security of their workmen and equipments including insurance etc.
3. The unit rates quoted shall include minor details which are obviously and fairly intended and which may not have been included in these documents but are essential for the satisfactory completion of the work.
4. Rates shall be quoted in both figures and words in clear legible writing. No overwriting is allowed. All scoring and cancellations should be countersigned by the bidder. In case of illegibility, the interpretation of the engineer-in-charge shall be the final and binding on the contractor.
5. Engineer-in-charge's decision regarding clarification of items in the schedule with respect to other sections of the contract shall be final and binding on the contractor.
6. The bidder shall submit a scheme showing the arrangement and equipment proposed to be used for conducting the work alongwith the rates.
7. Contractor shall make his own arrangement for water, electricity, accommodation, access to site and the cost of all such works shall be considered to be included in his quoted price.

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTITY	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs) Total Amounts (In Rs)	Total Amounts (In Rs)
Section A.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	30			
Section A.2	Carrying out topographical survey of plant and allied areas showing all permanent & general features and detailed contour survey by taking spot levels at 10m 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	410			
Section A.3	Carrying out route survey for laying pipe lines, road, drain etc as per specification showing permanent and general features and detailed contour survey by taking spot level at 2-5m intervals and at all breaks in the profile 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 longitudinal profiles as well as cross-sections at 50 m intervals or less in nearly flat/undulating terrains and at 20m intervals in hilly terrains, reports, CD and originals etc all complete as per specification and instructions of the engineer-in-charge.	Hectare	120			

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Vol-II-Price Bid

Section A: SCHEDULE OF QUANTITIES FOR TOPOGRAPHICAL SURVEY

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTITY	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs)	Total Amounts (In Rs)
Section A.4	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	4			
b	Grid/reference pillar	Each	200			
	TOTAL Price OF PART-B (In Figures) (In Rs)					
TOTAL Price OF PART-B (In Words) (In Rs)						

BHEL PSWR
T. S. No. BHE/PW/PUR/KHARGONE-GEO/1324
Vol-II-Price Bid
Section B: SCHEDULE OF QUANTITIES FOR GEOTECHNICAL INVESTIGATION

NOTES:

1. Details of items shall be read in conjunction with the corresponding specification, drawings and other tender terms.
2. The bidder shall quote for finished items of work and shall provide all necessary power, water, instruments, fuel, tools and plants, tackles, materials, transport, labour, supervision and maintenance till handing over, repairs, rectifications, safety and security of their workmen and equipments including insurance etc.
3. Rates shall be quoted in both figures and words in clear legible writing. No overwriting is allowed. All scoring and cancellations should be countersigned by the bidder. In case of illegibility, the interpretation of the engineer-in-charge shall be the final and binding on the contractor.
4. Engineer-in-charge's decision regarding clarification of items in the schedule with respect to other sections of the contract shall be final and binding on the contractor.
5. The bidder shall submit a scheme showing the arrangement and equipment proposed to be used for conducting the work along with the rates.
6. Contractor shall make his own arrangement for water, electricity, accommodation, access to site and the cost of all such work shall be considered to be included in his quoted price.

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTIT Y	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs) Total Amounts (In Rs)	Total Amounts (In Rs)
Aection B.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.	LS	1			
Aection B.2	Making 150mm nominal diameter bore hole up to a maximum depth of 25 m below ground level at various locations 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 1.0m interval alternate to collection of undisturbed soil samples up to 5m depth below ground level and at every 1.5m interval alternate to collection of undisturbed soil samples beyond 5 m depth, at change of strata and at depths wherever undisturbed soil samples could not be collected; collection of undisturbed sample (UDS) at every 1.0m interval alternate to conducting standard penetration test up to 5 m depth below ground level and at every 1.5m interval alternate to conducting standard penetration test beyond 5 m depth; 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.	M	210			

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Vol-II-Price Bid
Section B: SCHEDULE OF QUANTITIES FOR GEOTECHNICAL INVESTIGATION

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTIT Y	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs) Total Amounts (In Rs)	Total Amounts (In Rs)
Aection B.3	Core drilling (Nx size) in rock 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.	M	1820			
Aection B.4	Excavating trial pit of size 3m x 3m at various locations upto a maximum depth of 4m below ground level in all types of soil 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 and conducting field density test at 1m interval, starting from 1m depth below ground level 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	1260			
Aection B.5	Conducting plate load test in various locations at specified depth below ground level 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.4.	Each	10			
Aection B.6	Conducting cyclic plate load test in various locations at specified depth below ground level 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.4.	Each	10			
Aection B.7	Performing dynamic cone penetration test 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	20			
Aection B.8	Conducting electrical resistivity test at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	Each	35			
Aection B.9	Conducting pressure meter test in bore hole at 1m, 3m, 5m, 7m, 9m, 12m, 15m, 18m, & 20m depth below ground level in all type of strata including drilling and preparation of bore hole of required size etc all complete as per specification, drawings and as directed by the engineer-in-charge.	Each	6			

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Vol-II-Price Bid
Section B: SCHEDULE OF QUANTITIES FOR GEOTECHNICAL INVESTIGATION

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTIT Y	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs) Total Amounts (In Rs)	Total Amounts (In Rs)
Aection B.10	Conducting pump in type field permeability test by constant head or falling head method (suitability of type of test shall be as per site conditions) in various boreholes at 1.0m, 3.0m, 5.0m, 8.0m & 12m depth below ground level 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.2.	Each	14			
Aection B.11	Conducting seismic refraction test at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	M	2200			
Aection B.12	Conducting cross hole shear wave test in bore hole in all types of strata at 2m, 4m, 6m, 8m, 10m, 12m, 15m, 18m & 20m depth below ground level including drilling and preparation of required number of bore holes, 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.	Each	4			
Aection B.13	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	70			
b	Sieve analysis	Each	100			
c	Hydrometer analysis	Each	70			
d	Liquid limit and plastic limit	Each	100			
e	Shrinkage limit	Each	50			
f	Specific gravity	Each	70			
g	Swell pressure	Each	50			
h	Free swell index	Each	50			

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Vol-II-Price Bid
Section B: SCHEDULE OF QUANTITIES FOR GEOTECHNICAL INVESTIGATION

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTIT Y	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs) Total Amounts (In Rs)	Total Amounts (In Rs)
i	Relative density	Each	50			
j	Unconfined compressive strength	Each	50			
k	Direct shear test	Each	25			
L	Triaxial shear test					
l	unconsolidated undrained test	Each	50			
m	One dimensional consolidation test	Each	25			
n	Standard Proctor compaction test	Each	25			
o	CBR test	Each	25			
p	Chemical analysis	Each	15			
Aection B.14	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	100			
b	Specific gravity	Each	70			
c	Slake durability index	Each	100			
d	Unconfined compressive strength (both at saturated and in-situ water content)	Each	100			
e	Point load strength	Each	70			
f	Hardness	Each	70			

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Section B: SCHEDULE OF QUANTITIES FOR GEOTECHNICAL INVESTIGATION

Sl. No.	ITEM DESCRIPTION	UNIT	QUANTIT Y	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs) Total Amounts (In Rs)	Total Amounts (In Rs)
g	Soundness	Each	70			
h	Deformability (both at saturated and in-situ water content)	Each	70			
Aection B.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	15			
Aection B.16	Preparation and submission of draft report in 3 copies and final report in 8 hard copies and 2 soft copies on CD after the approval of draft report including all field records, laboratory test results, graphs, analysis of test results, photo graphs showing details of field tests/soil/rock samples/Trail pits and recommendation etc all complete as per specification.	LS	1			
	TOTAL Price OF Section-B (In Figures) (In Rs)					
TOTAL Price OF Section-B (In Words) (In Rs)						

VOLUME-II-Price Bid Specification (Section-A + Section-B)
Tender Specification No. BHE/PW/PUR/KHARGONE-GEO/1324
JOB:TOPOGRAPHICAL SURVEY AND GEO TECHNICAL INVESTIGATION FOR 2X660 MW KHARGONE STPP.

SUMMARY SHEET

SL NO	DESCRIPTION	AMOUNT (INR)
1.00	VOLUME-II-Price Bid Specification Section A: FOR TOPOGRAPHICAL SURVEY OF 2X660 MW KHARGONE STPP	
2.00	VOLUME-II-Price Bid Specification Section-B: FOR GEOTECHNICAL INVESTIGATION OF 2X660 MW KHARGONE STPP	
	GRAND TOTAL (Section-A + Section-B) (In Rs)	

GRAND TOTAL IN WORDS (Section-A + Section-B) (IN RS)