

# TENDER SPECIFICATION

NO: BHE/PW/PUR/PWHQ-GEO/1317

GEO- TECHNICAL INVESTIGATION AND TOPOGRAPHICAL  
SURVEY AT

1X 800 MW WANAKBORI TPS

GUJRAT

## VOLUME-II-PRICE BID SPECIFICATION (PART A: TOPOGRAPHICAL SURVEY AND PART 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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**T E N D E R   S P E C I F I C A T I O N**

**NO: BHE/PW/PUR/PWHQ-GEO/1317**

**GEO- TECHNICAL INVESTIGATION AND TOPOGRAPHICAL SURVEY  
AT**

**1X 800 MW WANAKBORI TPS**

**GUJRAT**

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:

**VOLUME-II-Price Bid Specification**  
**PART-A: FOR TOPOGRAPHICAL SURVEY OF 1 X 800 MW STPP, WANAKBORI**

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**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. Quantities of the various items mentioned in the schedule of quantities are approximate and may vary upto any extent or be deleted altogether and new items may be added. The contractor shall carry out all the works upto a variation of  $\pm 25\%$  (plus or minus twenty five percent) on the tendered value of the contract and all tendered rates shall remain firm within this limit.
5. 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.
6. 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.
7. The bidder shall submit a scheme showing the arrangement and equipment proposed to be used for conducting the work along with the rates.

**VOLUME-II-Price Bid Specification**  
**PART-A: FOR TOPOGRAPHICAL SURVEY OF 1 X 800 MW STPP, WANAKBORI**

8. 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	UNIT	QTY.	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs)	Total Amounts (In Rs)
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	5			
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, CD and originals etc all complete as per specification and instructions of the engineer-in-charge.	Hectare	100			

**VOLUME-II-Price Bid Specification**  
**PART-A: FOR TOPOGRAPHICAL SURVEY OF 1 X 800 MW STPP, WANAKBORI**

SL. NO	ITEM	UNIT	QTY.	Unit Rates in Figures (In Rs)	Unit Rates in Words (In Rs)	Total Amounts (In Rs)
3	Carrying out route survey for laying pipe lines, road 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	25			
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			
<b>Total Price for Part A (In Rs)</b>						

**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. Quantities of the various items mentioned in the schedule of quantities are approximate and may vary upto any extent or be deleted altogether and new items may be added. The contractor shall carry out all the works upto a variation of +25% (plus or minus twenty five percent) on the tendered value of the contract and all tendered rates shall remain firm within this limit.
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 along with the rates.
7. 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.

S.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)
1	Mobilisation of necessary <b>equipments</b> , 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. <b>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</b>	LS	1			

VOLUME-II-Price Bid Specification  
PART-B: FOR GEOTECHNICAL INVESTIGATION OF 1 X 800 MW STPP, WANAKBORI

S.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)
2	Making 150mm nominal diameter <b>bore hole</b> at various locations upto a maximum depth of 40 m below ground level in <b>all types of soil</b> 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 1m interval down upto 5m depth below ground level and at every 1.5m interval beyond 5m depth, at change of strata and at depths wherever undisturbed soil samples could not be collected; collection of undisturbed soil samples(UDS) at every 1m interval down upto 5m depth below ground level and at every 1.5m interval beyond 5m 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	1500			
3	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	475			
4	Excavating <b>trial pit (TP)</b> 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	480			

VOLUME-II-Price Bid Specification  
PART-B: FOR GEOTECHNICAL INVESTIGATION OF 1 X 800 MW STPP, WANAKBORI

S.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)
5	Conducting <b>plate load test (PLT)</b> in various locations at 3m 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 <b>as per item no.4</b>	Each	<b>5</b>			
6	Conducting <b>cyclic plate load test (CPLT)</b> in various locations at 3 m 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 <b>as per item no.4</b>	Each	<b>2</b>			
7	Conducting block vibration test in various locations at 4 m depth including laying of plain cement concrete block of size 1.5m x 0.75m x 0.70m using M-15 grade concrete, all complete as per IS: 5249, 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	<b>2</b>			
8	Performing Static cone penetration test at various locations all complete as per specification, drawings and as directed by the engineer-in-charge.	Each	<b>10</b>			
9	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	<b>10</b>			
10	Conducting electrical resistivity test at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	Each	<b>20</b>			
11	Conducting pressure meter test in bore hole at 2m, 4m, 6m, 8m, 10m, 12m, 15m, 18m, 21m,24m,27m & 30m 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	<b>4</b>			
12	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 1.5 m and 3 m 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	<b>5</b>			

VOLUME-II-Price Bid Specification  
PART-B: FOR GEOTECHNICAL INVESTIGATION OF 1 X 800 MW STPP, WANAKBORI

S.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)
13	Conducting pump out type field permeability test below water table in a well including boring/drilling/preparation of 400mm diameter well at 15m depth below ground level, installing 250mm diameter GI/MS perforated pipes, providing and installing observation pipes of 50mm diameter at regular intervals along three radial lines and backfilling the same with sand after completion of the test etc all complete as per specification, drawings and as directed by the engineer-in-charge.	Each	2			
14	Conducting seismic refraction test at various locations complete as per specification, drawings and as directed by the engineer-in-charge.	M	1200			
15	Conducting field vane shear test in various locations at 2 m depth below ground level including collection of disturbed soil sample etc all complete as per specification, drawings and as directed by the engineer-in-charge.	Each	10			
16	Conducting field CBR test in various locations at 0.5m depth below ground level complete as per specification, drawings and as directed by engineer-in-charge.	Each	4			
17	Conducting percolation test at 3m depth in trial pit complete as per IS 2470 (part 2)-1985, 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	5			
18	Conducting <b>Laboratory Test</b> on <b>soil samples</b> 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	75			
	b)Sieve analysis	Each	250			
	c)Hydrometer analysis	Each	50			
	d)Liquid limit and plastic limit	Each	250			
	e)Shrinkage limit	Each	20			

VOLUME-II-Price Bid Specification  
PART-B: FOR GEOTECHNICAL INVESTIGATION OF 1 X 800 MW STPP, WANAKBORI

S.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)
	f) Specific gravity	Each	50			
	g) Swell pressure	Each	20			
	h) Free swell index	Each	20			
	i) Relative density	Each	10			
	j) Unconfined compressive strength	Each	25			
	k) Direct shear test	Each	25			
	Triaxial shear test					
	l) unconsolidated undrained test	Each	25			
	II) consolidated undrained test	Each	10			
	III) consolidated drained test	Each	10			
	m) One dimensional consolidation test	Each	15			
	n) Standard Proctor compaction test	Each	10			
	o) CBR test	Each	10			
	p) Chemical analysis	Each	10			
	q) Modified proctor compaction test	Each	5			

VOLUME-II-Price Bid Specification  
PART-B: FOR GEOTECHNICAL INVESTIGATION OF 1 X 800 MW STPP, WANAKBORI

S.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)
19	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)Moisture content, porosity & density	Each	20			
	b)Specific gravity	Each	15			
	c)Slake durability index	Each	20			
	d) Crushing strength	Each	20			
20	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			
21	Preparation and submission of draft report in 3 copies and final report in 5 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, photographs showing details of field tests/soil/rock samples/trail pits and recommendation etc all complete as per specification.	LS	1			
	<b>TOTAL Price OF PART-B (In Figures) (In Rs)</b>					
<b>TOTAL Price OF PART-B (In Words) (In Rs)</b>						

**VOLUME-II-Price Bid Specification (Part A- + Part B)**  
**JOB: TOPOGRAPHICAL SURVEY AND GEO TECHNICAL INVESTIGATION FOR 1 X 800 MW WANAKBORI ,SUPER THERMAL POWER PROJECT**  
**GUJRAT**

**SUMMRAY SHEET**

SL NO	DESCRIPTION	AMOUNT (INR)
1.00	VOLUME-II-Price Bid Specification PART-A: FOR TOPOGRAPHICAL SURVEY OF 1 X 800 MW STPP, WANAKBORI	
2.00	VOLUME-II-Price Bid Specification PART-B: FOR GEOTECHNICAL INVESTIGATION OF 1 X 800 MW STPP, WANAKBORI	
3.00	GRAND TOTAL (Part A + Part B) (In Rs)	

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

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