

# **TENDER SPECIFICATION**

**BHEL: PSSR: SCT:1951**

**FOR**

**Geotechnical Investigation and  
Topographical survey work for Flue Gas  
Desulphurization system of  
Unit 12, at 1 X 800 MW  
at Kothagudem Power Project,  
Khammam District, Telangana State**

**VOLUME –II**

**PRICE BID**



**BHARAT HEAVY ELECTRICALS LIMITED**

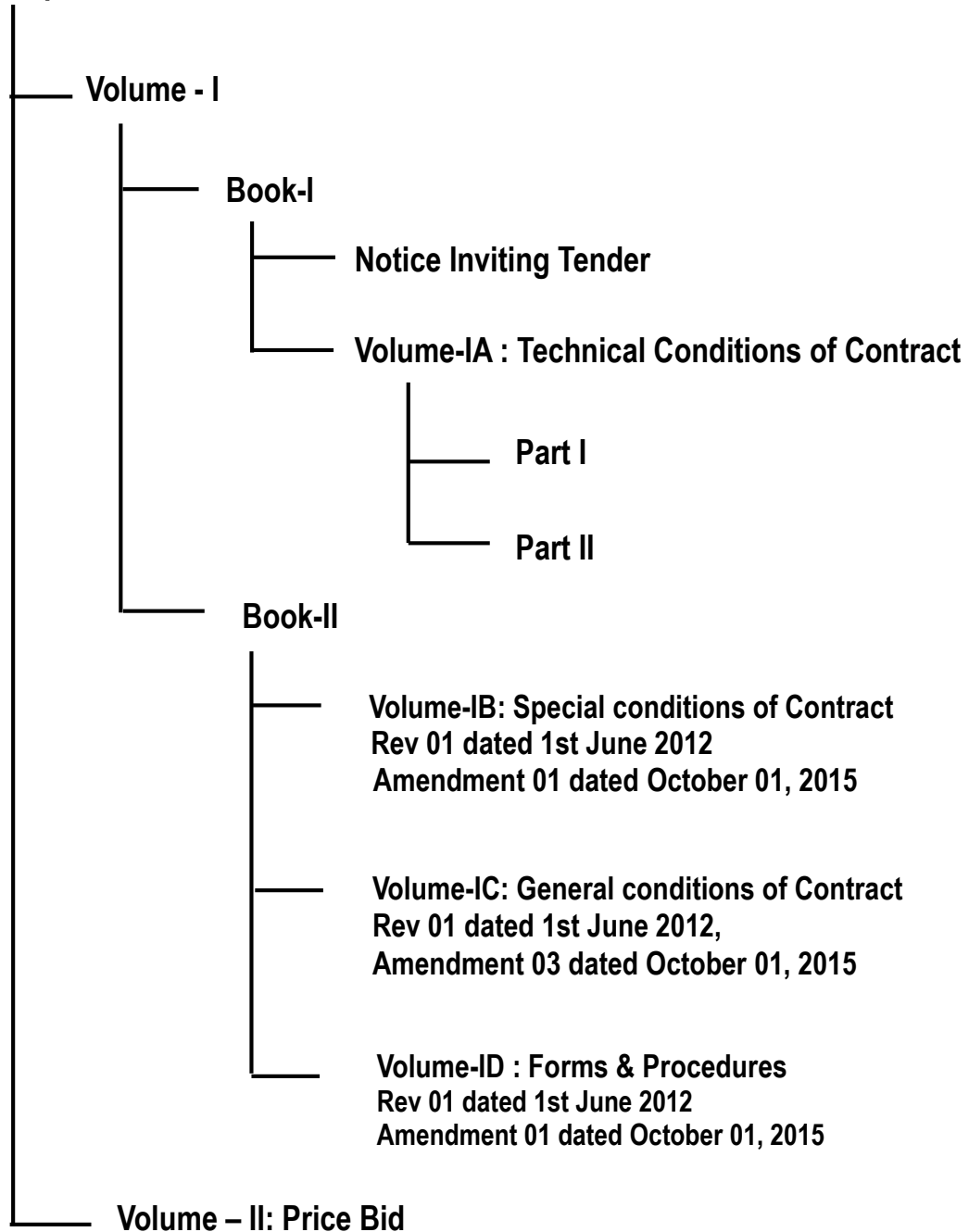
(A Government of India Undertaking)

Power Sector – Southern Region

Tek Towers, No. 11, Old Mahabalipuram Road,  
Okkiyam Thoraipakkam , Chennai-600097

**TENDER SPECIFICATION CONSISTS OF**

**Tender Specification**



## PRICE BID

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CONTENTS	
Description	No. of pages
Part A: Instructions to the Bidders	1
Part B: Format for total amount (Enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender)	(Separate Excel File)
Part C: Bill of quantities with weightage for amount of each items w.r.t. the total quoted price	2

## PRICE BID

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### **PART-A**

#### **INSTRUCTIONS TO BIDDERS**

1. The quantity indicated in the BOQ in Part C of Price Bid is approximate only and is liable for variation. Payment will be as per actual quantity executed and as certified by BHEL Engineer.
2. Tenderers are requested to affix their company seal and authorized signature in all pages.
3. Bidders shall quote 'Total Amount' in the format enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender and upload the same under 'Packet details - > Tender covers -> Finance '(Cover Type Description – Price Bid)' and same shall be taken into account for evaluation and awarding and hence, shall be complete in all respect for the full scope of work defined in specification and in accordance with terms & conditions of the tender. Any other entry elsewhere in the price bid shall be treated as Null and Void. Quoting of rates in any other form/formats will not be entertained.
4. The above mentioned 'Total amount' is for the entire Bill of Quantity (BOQ) given in Part C of the Price Bid.
5. BHEL has pre-fixed the weightages for the amount of individual items of Bill of Quantity with respect to the 'Total Amount' in Part C of Price Bid.
6. Based on the pre-fixed weightages, the amount for the individual items of the Bill of Quantity shall be arrived at. This amount shall be rounded off to the nearest rupee.
7. Based on the quantities of individual item and the amount arrived in Sl. No: 6 above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
8. Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per Sl No.7 above.
9. The quantities given in the contract are tentative and may change to any extent (both in plus side and minus side). The derived item rates (as mentioned above) for individual items shall remain firm irrespective of any variations in the individual quantities. No compensation becomes payable in case the variation of the final executed contract value is within the limit of Minus (-) 25% of awarded contract value.

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:1951 for Geotechnical Investigation and Topographical survey**

**at Kothagudem Stage VII Unit 12, 1 X 800 MW**

<b>Ref.No.</b>	<b>Description</b>	<b>Unit of Measurement</b>	<b>Qty.</b>	<b>Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount</b>
GEO TECH NICA L INVE STIG ATIO N	--	--		
1.0	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	.0645342

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2.0	Making 150mm nominal diameter bore hole up to a maximum depth of 30 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 m interval alternate to collection of undisturbed soil sample up to 5 m depth below ground level and at every 1.5 m interval alternate to collection of undisturbed soil sample beyond 5 m depth, at change of strata and at depth wherever undisturbed soil sample could not be collected; collection of undisturbed sample (UDS) at every 1 m interval alternate to conducting standard penetration test up to 5 m depth below ground level and at every 1.5 m 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	145	.0554058
3.0	Core drilling(Nx size) in rock using hydraulic feed rotatry drill and double tube core barrel with diamond bit including collection of core samples,performing SPT at locatiobns 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	300	.3719209

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4.0	Excavating trial pit of size 3m x 3m at various locations up to a maximum depth of 4m depth below ground level in all types of soil/ash 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	110	.0298895
5.0	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	1	.0178318
6.0	Conducting cyclic plate load test in various locations at specified depth ground wevel 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	3	.0611377
7.0	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	1	.0033965

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
8.0	Conducting electrical resistivity test at various locations complete as per specification, drawings and as directed by the engineer-in-charge	Each	1	.0016983
9.0	Conducting pressure meter test in bore hole at 1m,3m,5m,7m,9m,12m,15m,18m,20m,25m,30m,35m and 40m 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	1	.1018961
10.0	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 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	3	.0412679
11.0	Conducting seismic refraction test at various locations complete as per specification drawings and as directed by the engineer in charge	M	1	.0001868
12.0	Conducting cross hole shear wave test in bore hole in all types of soil at 2m,4m,6m,8m,10m,12m,15m,18m&20m,25m,30m,35m and 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	Each	1	.1188788



**Part C : Bill of Quantities**

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13.0	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	40	.0011548
--	b)Sieve analysis	Each	50	.001953
--	c)Hydrometer analysis	Each	15	.0007133
--	d)Liquid limit and plastic limit	Each	50	.001953
--	e)Shrinkage limit	Each	10	.0002717
--	f)Specific gravity	Each	15	.0004329
--	g)Swell Pressure	Each	10	.0005944
--	h)Free swell index	Each	10	.0005604
--	i)Relative density	Each	10	.0005604
--	j)Unconfined compressive strength	Each	20	.0011888
--	k)Direct shear test	Each	10	.0007642
--	l)Triaxial shear test	Each	5	.0003397
--	i)Unconsolidated undrained test	Each	5	.0006793
--	m)One dimensional consolidation test	Each	5	.0011039
--	n)Standard Proctor compaction test	Each	5	.0014858

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--	o)CBR Test	Each	5	.0033965
--	p)Chemical Analysis	Each	6	.0040758
14.0	Conducting laboratory test on rock samples including preparation of samples to determine the following properties etc all complete as per specification.	--		
--	a)Moisture content, porosity&density	Each	20	.0022077
--	b)Specific gravity	Each	20	.0022077
--	c)slake durability index	Each	20	.007812
--	d)unconfined compressive strength (both at saturated and insitu water content )	Each	20	.0030569
--	Point load strength	Each	20	.0025474
--	Hardness	Each	10	.0012737
--	Soundness	Each	10	.0028021
--	Deformability(both at saturated and insitu water content )	Each	20	.0100198
15.0	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	6	.0050948

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16.0	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	.0161336
TOPO GRAP HICA L SURV EY	--	--		
1.0	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	1	.0110387

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2.0	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.	Hectatre	5	.0146474
3.0	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-incharge. a)Bench mark pillar b) Grid/reference pillar	--		
a	Bench mark pillar	Each	2	.0084487
b	Grid/ reference pillar	Each	6	.0234361
<b>TOTAL Weightage</b>				0.9999992