

**TENDER SPECIFICATION
BHEL: PSSR: SCT: 1933
FOR**

**Topographical Survey, Geotechnical
Investigation & Bathymetric Survey**

at

3 x 800MW Talabira Thermal Power Plant

VOLUME-II

PRICE BID



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

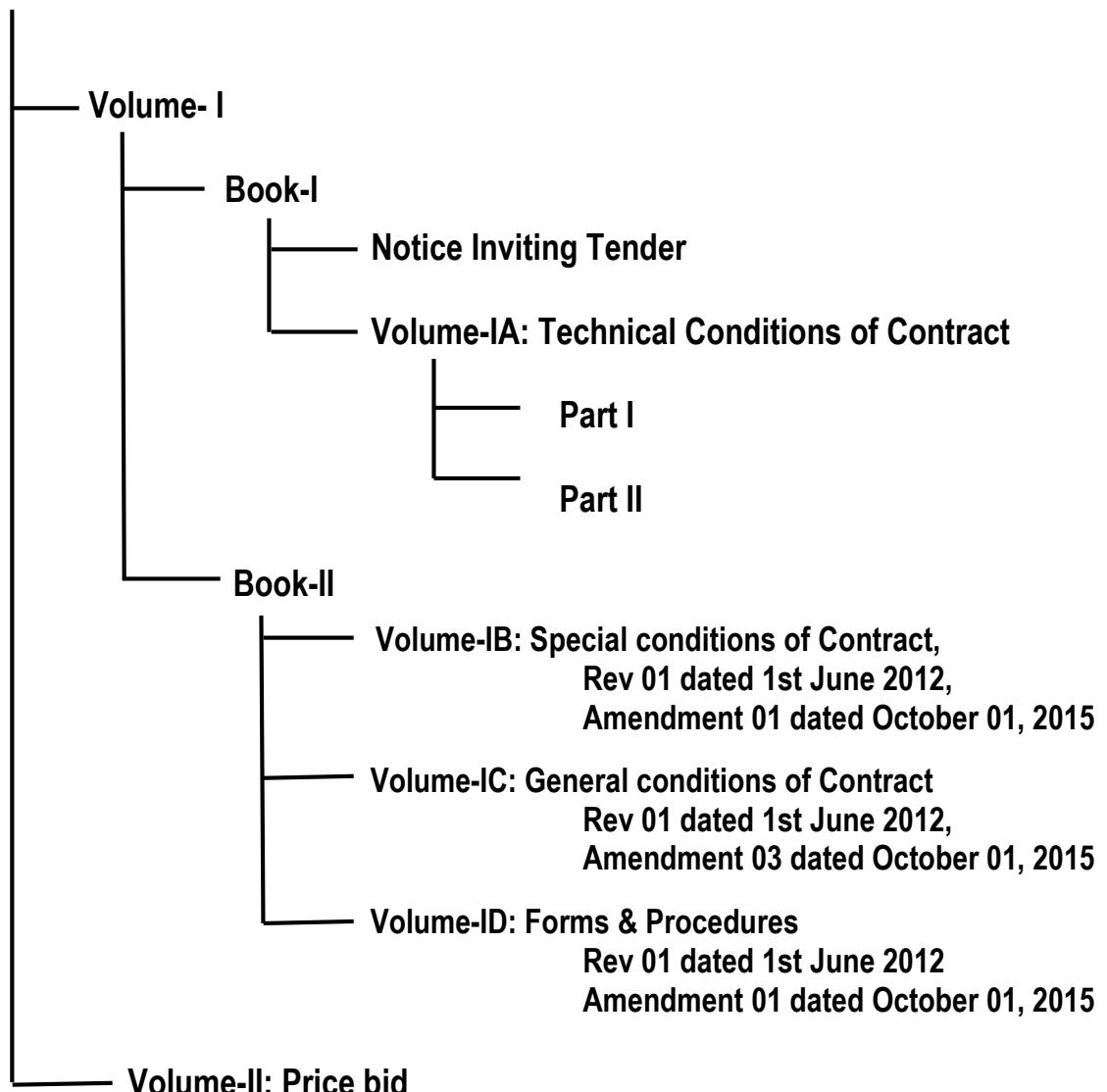
Power Sector – Southern Region

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

PRICE BID

TENDER SPECIFICATION CONSISTS OF

Techno-Commercial Bid



PRICE BID

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PRICE BID

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.

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1944 for Geotechnical Investigation, Topographical survey and Bathymetric Survey
at 3X800 MW NLC Talabira TPP**

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
--	A. Topographical Survey and bathymetric survey	--		
1.0	Mobilisation of necessary equipments, men and materials to the project site for carrying out topographical survey and 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	.0250441
2.0	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	4	.0071237
3.0	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 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, compact disc and originals etc all complete as per specification and instructions of the engineer-in-charge.	Hectare	36	.0388685
4.0	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 10m 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 at 10m intervals and cross-sections at 100 m intervals, reports, CD and originals etc all complete as per specification and instructions of the engineer-in- charge.	Hectare	22	.0979503

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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
5.0	Carrying out bathymetric survey offshore in river/water by digital echo-sounder supported by GPS and computer based data collection software for the specified area by taking bed level at 10m interval, water level by water level gauges and any other field works as necessary for completion of the said item of work along with preparation and submission of plans (maps), longitudinal section, cross section, report, CDs etc including mobilisation of necessary equipments/ instruments, softwares, tools & plants, materials, man power, site clearance, earth work, scaffolding, transportation/ navigation, testing, insurance, approval, demobilisation etc all complete as per specification, drawings and as directed by the engineer-in- charge.	Hectare	13	.0434098
6.0	Construction of bench mark pillar/reference 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	.0182544
b	Reference pillar	Each	5	.0205918
--	B. Geo technical Works - LAND	--		
1.0	Mobilisation of necessary equipments, men and materials to the project site for carrying out 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.(Minimum 5 nos rigs).	LS	1	.0471199

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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 10 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.	RM	230	.0836289
3.0	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.	RM	100	.0986924
4.0	Excavating trial pit of size 3m x 3m at various locations up to 3m depth below ground level in all types of soil and in weathered rock/soft 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 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	870	.1258884

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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
18.0	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	30	.0010574
b)	Sieve analysis	Each	40	.001484
c)	Hydrometer analysis	Each	10	.0004452
d)	Liquid limit and plastic limit	Each	40	.0017809
e)	Shrinkage limit	Each	5	.0002318
f)	Specific gravity	Each	10	.0003709
g)	Swell Pressure	Each	5	.0004079
h)	Free swell index	Each	5	.000167
i)	Unconfined compressive strength	Each	5	.0003617
j)	unconsolidated undrained test	Each	5	.0007975
k)	One dimensional consolidation test	Each	5	.0003617
l)	Chemical analysis	Each	2	.0005565
19.0	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	15	.00128
b)	Specific gravity	Each	15	.0010018
c)	Slake durability index	Each	15	.0036731

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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
d)	Unconfined compressive strength (both at saturated and insitu water content)	Each	20	.0018549
e)	Point load strength	Each	15	.00128
f)	Hardness	Each	15	.0011131
g)	Soundness	Each	15	.005788
h)	Deformability (both at saturated and insitu water content)	Each	10	.0021518
20.0	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	2	.0008905
21.0	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, photographs showing details of field tests/soil/rock samples/Trail pits and recommendation etc all complete as per specification.	LS	1	.017067
--	C. Geo technical Works - In WATER	--		
1.0	Mobilisation of necessary equipments, men and materials to the project site for carrying out 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	.1317134

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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 10 m below river bed level/water at various locations in all types of soil including laterite using suitable approved method of boring including chiselling, cleaning, providing casing pipes as required/as directed; performing standard penetration test at every 1.5 m interval alternate to collection of undisturbed soil sample, at change of strata and at depth wherever undisturbed soil sample could not be collected; collection of undisturbed sample (UDS) at every 1.5 m interval alternate to conducting standard penetration test, collection of disturbed soil samples and water samples, sealing and packing of samples etc., transportation of all the collected samples to the laboratory etc. all complete as per specification and as directed by the engineer-in-charge.	RM	96	.1154032
3.0	Collection of soil sample at the river bed /water bed at various locations as per specification and as directed by the engineer-in-charge.	Each	12	.0059661
4.0	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.	RM	35	.0662277
5.0	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	15	.0005563
b)	Sieve analysis	Each	24	.0008902
c)	Hydrometer analysis	Each	5	.0002226
d)	Liquid limit and plastic limit	Each	24	.0010685

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e)	Shrinkage limit	Each	3	.0001391
f)	Specific gravity	Each	10	.0003709
g)	Free swell index	Each	5	.000167
i)	Unconfined compressive strength	Each	5	.0003245
k)	Unconsolidated undrained triaxial shear test	Each	5	.0007605
l)	One dimensional consolidation test	Each	5	.0005009
n)	Chemical analysis	Each	2	.000497
o)	Swell pressure	Each	5	.0004079
6.0	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	6	.000512
b)	Specific gravity	Each	6	.0004007
c)	Slake durability index	Each	6	.0014693
d)	Unconfined compressive strength (both at saturated and in-situ water content)	Each	12	.0011128
e)	Point load strength	Each	6	.000512
f)	Hardness	Each	6	.0004452
g)	Soundness	Each	6	.0023152
h)	Deformability (both at saturated and in-situ water content)	Each	6	.0012909

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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
7.0	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	2	.0008162
8.0	Preparation and submission of draft report in 2 copies and final report in 3 hard copies and 2 soft copies on compact discs 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	.0152118
TOTAL Weightage				0.9999969