

BOQ FOR CIVIL AND ELECTRICAL WORKS FOR 275 M HIGH RCC SINGLE FLUE CHIMNEY WITH BRICK LINER AND STACK ELEVATOR AT 1x500MW UKAI TPS EXTN UNIT#6 .						
Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
RATE SCHEDULE PART - A (CIVIL WORKS)						
1	EARTH WORK IN EXCAVATION, BACKFILLING AND DISPOSAL AS PER SPECIFICATION AND DRAWINGS					
(i)	Excavation including providing cofferdams, shoring, strutting, sheeting, bracing, draining and pumping out water other than water below ground water table, clearing all grass, vegetation etc. including trimming of excavation bottom, staking, levelling, grading etc. of excavated materials all complete as per specifications, drawings and instructions of the engineer, including a lead up to 100 meters and a lift up to 2.0 meters.					
a)	In all types of soils including ash, morrum, laterite	CUM	4000			
b)	In soft rock and weathered rock which can be excavated by means of crow bar, pick axe, pneumatic rock breaker attachment with poclaim etc. but does not require chiselling, chemical grouting and blasting.	CUM	1000			
c)	In hard rock , by means of chiseling or controlled blasting including provision of sensor to assess the impact of blast on the adjacent structures.	CUM	1900			
2	Extra over item 1 above, for all types of soil/rock, for additional lifts beyond the initial lift of 2 meters (included in item 1 above) all complete as per specifications, drawings and instructions of the engineer for the following lifts:					
i)	In all types of soils					
a	beyond 2 m and upto 4 m	CUM	2000			
b	beyond 2 m and upto 7 m (from qty. of excavation measured between 4m to 7m depth)	CUM	1000			

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
ii)	In all types of rocks					
a	beyond 2 m and upto 4 m	CUM	500			
b	beyond 2 m and upto 7 m (from qty. of excavation measured between 4m to 7m depth)	CUM	1000			
3	Extra over item 1 above for excavation below ground water table including lowering of ground water table to maintain dry working conditions for all activities up to filling/testing, water proofing all complete as per specifications, drawings and instructions of the engineer.	CUM	4500			
4	Extra over item 1 above for carriage of all types of excavated materials beyond the initial lead of 100 m (included in item 1 above) all complete as per specifications, drawings and instructions of the engineer for the following leads					
i)	Carriage beyond initial lead of 100 m but not exceeding 500 m	CUM	3000			
ii)	Carriage beyond initial lead of 100 m but not exceeding 2 Km	CUM	600			
iii)	Carriage beyond initial lead of 100 m but not exceeding 5 Km	CUM	100			
iv)	Carriage beyond initial lead of 100 m but not exceeding 10 Km.	CUM	100			
5	i)Filling using selected excavated materials in trenches, plinths, sides of foundations and other underground structures, pipes etc., in layers not exceeding 200 mm loose thickness for all leads and lifts and including loading from stock pile, carting, unloading, filling, watering and compacting / ramming each layer, all complete as per Specifications, drawings and as directed by the Engineer to achieve 95% standard proctor density.	CU.M	2000			
	ii)Levelling and compacting the surplus excavated earth obtained from Item No. 1 including all lifts & as per specifications and as directed by the Engineer with the cost of all labour, material and equipment complete.	CU.M	5000			

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
6	Supplying and laying (inside chimney in the space below the grade level slab) crushed rock and sand fill in layers no more than 150 mm thick each and thoroughly compacted by compacting equipment and by water flooding to achieve maximum density for all leads and lifts including all labour, materials, equipment etc. complete as per drawings, specifications and directions of the Engineer.	CU.M	700			
7	Providing and laying Nominal Mix plain cement concrete 1:4:8 with graded aggregate (with maximum size of coarse aggregate not exceeding 40 mm) at all levels for all kinds of work like mass concrete, lean concrete, mudmat, filling etc. including labour, materials, equipment, handling, transporting, batching, curing, testing etc. all complete as per specifications, drawings and instructions of the Engineer.	CU.M	150			
8	Providing and laying design mix cement concrete with graded aggregate (maximum size of coarse aggregate not exceeding 20 mm) for reinforced concrete work at all levels for all kinds of work, including labour, materials, equipment, handling, transporting, batching, mixing, placing, levelling, compacting, curing, testing etc. and rendering or cleaning and finishing the exposed surface with cement mortar (1:3) to give smooth and even surface, all complete as per specifications, drawings and instructions of the Engineer, but excluding all formwork and reinforcing steel:					
i)	For works below ground level					
	a) Grade M-25 (foundations, etc)	CU.M	4500			
ii)	For works above ground level					
	a) Grade M-20 (grade level slab)	CU.M	80			
	b)Grade M-30 for chimney shell, corbels and external platforms and other shell attachments.	CU.M	7000			

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
9	Taking delivery from BHEL store,loading ,unloading at site, providing and placing reinforcement , for reinforced concrete work,at all levels, for all kinds of work, including transportation, cleaning, derusting, straightening, cutting, bending, binding in position with annealed wire and/or welding, providing concrete cover blocks, pins, separators, chairs,supports for reinforcement, etc.with all materials, labour,cost of binding wire, equipment, handling, transporting,testing, etc. preparation of bar bending schedules, all complete as per specifications, drawings and instructions of the Engineer. Reinforcement/TMT bars shall be supplied by BHEL free of cost.					
i)	For works below ground level					
	a) High strength deformed bars of Grade Fe - 500	MT	400			
ii)	For works above ground level					
	a) Mild steel reinforcement bars	MT	27			
	b) High strength deformed bars of Grade Fe - 500.	MT	700			
10	Providing and fixing formwork of approved quality for cast-in-situ, plain or reinforced concrete works of any type and section (including curved surfaces and chimney shell) for all elevations, including labour, materials, equipment, waste of forms, shoring, strutting, scaffolding, staging, tying, nailing, caulking, bolting etc. and removal of form work and staging etc. all complete as per specifications, drawings and instructions of the Engineer.					
i)	For works below ground level	SQ.M	500			
ii)	For works above ground level					
	a) Inner and outer faces of wind shield with slip form shuttering (For RCC chimney shell)	SQ.M	26000			
	b) All other components of the superstructure including slabs, beams, columns, walls, enclosures, mini shells, external platforms, corbels, other shell attachments, chases/recesses in shell etc.	SQ.M	2000			
11	Providing and fixing formwork in shell openings (above 0.1 sq.m surface area) including cutting, formation of shapes and all other operations required for making the required shape and size, removal of formwork, all complete as per specifications, drawings and instructions of the Engineer.	SQ.M	60			
		4 of 12			SIGNATURE OF BIDDERS WITH SEAL	

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
12	Preparing detailed fabrication drawings and after approval by the BHEL Design Engineer, supplying, fabricating, erecting and installing miscellaneous steel parts to be embedded/cast in concrete (like staircase embedments, corbel face plates, etc) at all positions and levels including the cost of all labour, materials and equipments for setting materials in concrete, grouting, welding, bolts & bolting, expansion anchors, drilling, cutting, etc. complete as per drawings and specification. (Including supply of steel materials by Contractors.)	MT	2			
13	Preparing detailed drawings and after approval by the BHEL Design Engineer, supplying, fabricating and erection of galvanised steel strakes at all levels alongwith fittings and fixtures including transporting, lifting, setting material in place, embedding components in concrete, with the cost of all labour, cutting, grinding, drilling, bolts and bolting, washers, nuts and lock nuts, pipe sleeves, welding, pre-heating of welded joints, testing of welds, galvanising, priming and finish painting complete as per drawings, specifications, and the direction of the Engineer.	MT	5			
14	Supplying and laying in position shaped acid resisting bricks conforming to class - I of IS:4860) for liners at all elevations having strength not less than 70 N/sq.mm.with potassium silicate type chemical resistant mortar including the cost, for all leads and levels, labour, materials, mortar, raking joints, pointing, curing, etc. complete as per drawings and specifications.	CuM	1000			
14(a)	Supplying and laying in position shaped fire clay bricks conforming to Group A of IS:6) for liners at all elevations having strength not less than 20 N/sq.mm. with ground fire clay / suitable heat resisting cement mortar including the cost, for all leads and levels, of all labour, materials, mortar, raking joints, pointing, curing, etc. complete as per drawings and specifications.	Cu.M	1000			
15	Supplying, fabricating and installing galvanised steel circumferential and vertical reinforcing bands to the brick liners at all elevations including the cost of all labour, transportation, materials, bolts and bolting,priming, finish painting, etc. complete as per drawings and specifications.	MT	122			
		5 of 12			SIGNATURE OF BIDDERS WITH SEAL	

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
16	Supplying and fixing resin bonded rock wool insulation slabs of density not less than 100 kg/cu.m on the outside surface of the brick liners, having maximum co-efficient of thermal conductivity shall be 0.52 MW/CM/DegC at mean temperature of 100 degree C inside surface of the mini shells, and wherever as directed by the En gineer, into two layers (each 50 mm thick) the insulation shall be in the form of slabs wrapped on the outermost surface with galvanised wire mesh including the cost of all materials comprising pins/studs/anchors/ embedded in the liners and mini shells, wire netting, speed washers, tying wires, etc. including the cost of all equipment, labour, transportation, lifting to all heights, fixing, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Cu.M	900			
17	Supplying and laying vermiculite concrete in the liner basin including the cost of all labour, material and equipment for handling, transporting, mixing, lifting, placing, curing, finishing of surface etc. complete as per drawings and specifications	CU.M	45			
18	Supplying and laying acid resisting castable refractory lining as indicated in the drawings including the cost of all labour, material, and equipment for handling, transporting, mixing, lifting, placing, curing, finishing of surface etc. complete as per drawings and specifications	CU.M	10			
19	Supplying and laying shaped/curved acid resisting bricks (conforming to class I of IS:4860) in the liner basin using potassium silicate mortar including the cost of all labour, materials, mortar, raking joints, pointing with phenolic based acid resisting cement (conforming to IS:4832, Part II), curing, etc. complete as per drawings and specifications including design of the brick shapes by the Contractor and approval by the Engineer.	CU.M	45			

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
24	Supplying, fabricating and installing at various locations and elevations of the chimney system the following miscellaneous metal items complete with the cost of all labour, material and equipment, transporting, lifting, setting in place, anchor fasteners, anchoring, welding, bolts and bolting, priming, painting or galvanising, grouting etc. complete as per drawings and specifications. Rates shall include preparation of detailed fabrication drawing and its approval by BHEL Design Engineer.					
	a) Mild steel ladders with cage outside the chimney, vent covers & guides, bird screens and other miscellaneous steel not specifically mentioned.	MT	5			
	b) 40 mm nominal bore medium class MS rectangular hand railing (for internal and external platforms)	MT	4			
	c) Miscellaneous galvanised mild steel items	MT	1			
25	Supply, fabricating and installing at the top of chimney shell, grey cast iron caps of all material including asbestos mill boards, bronze bolts and nuts, brass washers, non - shrink grout, acid resistant mortar, insulation over the A/R mortar etc. including the cost of all painting etc. complete as per drawings and specifications.	MT	4			
26	Supplying and packing slag or mineral wool as per drawing and specifications.	CUM	25			
27	Supplying and packing 25 mm dia. Asbestos rope between insulation and brick works at corbels as per drawings and specifications.	RM	1500			
28	Supplying and packing 12 mm dia. asbestos mill boards over corbels under brick lining as per drawings and specifications.	SQM	250			
29	Supplying and installing ready mix castable refractory concrete at opening of chimney shell baffle wall and at other locations including all necessary arrangement for keeping them in position as per drawings and approval of Engineer.	CUM	15			
30	Supplying and placing in position 230 mm thk baffle wall with acid resistant mortar, RCC/steel beams including all labour, material complete as per drawings and specifications.	CUM	425			

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
31	Providing and laying 40 mm thick heavy duty patent stone flooring with Ironite hardner topping. Under layer of 28mm thick cement concrete mix 1:1.5:3 and top layer of 12mm thick metallic concrete of mix 1:2 (1 cement hardner mix:2 stone aggregate 6mm nominal size) by volume with which metallic hardening compound of approved quality is mixed in the ratio 4:1 (4 parts of cement and 1 part of metallic floor hardening compound) of approved quality by weight including cement slurry, rounding off edges and aluminium strips etc. complete.	SQ.M.	80			
32	Providing brick work in cement mortar 1:6 (1 cement : 6 coarse sand) in works at all heights, places and position ground floor slab including raking out joints, curing, scaffolding complete excluding plastering and painting. Using bricks of class designation 7.5 of nominal dimensions as per specification.	Cu.M.	10			
33	Providing 15 mm thick plaster in cement mortar 1:6 on walls, finished to a smooth finish as per specification.	SQ.M.	75			
	Sub Total of Part - A (Civil works)					

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
	RATE SCHEDULE - B (ELECTRICAL WORKS)					
E1	Supply, Erection & commissioning of 415V, 200A, 50 KA for 0.25 sec, 4 wire AC Distribution Board with 1No. incomer (SFU) & 9 nos. of 100A (TPN) outgoing complete in all respects	No.	1			
E2	Supply, Erection & commissioning of 415V, 200A, 4 wire AC Emergency Lighting distribution board alongwith 50KVA lighting transformer (415/433 V, Dyn11, Z=4%, ±2x2.5% Off Ckt. Tap) with 2 nos. of incomers with auto changeover facility using contacts and 6 nos. 100A SFU (TPN) outgoing complete in all respects	No.	1			
E3	Supply, Erection & commissioning of Normal AC lighting panel outdoor type with degree of protection IP 55 with one no. 100A SFU (TPN) Incomer , 18 outgoing (16A SP MCBs) complete in all respects.	No.	2			
E4	Supply, Erection & commissioning of Emergency lighting panel outdoor type with degree of protection IP 55 with One no. of 100A TPN/SFU incomer and 12 outgoing (16A, SP MCBs) complete in all respects.	No.	1			
E5	Supply, Erection & commissioning of Aviation lighting panel outdoor type with degree of protection IP 55 with one no. 100A SFU (TPN) Incomer , 8 outgoing 32A SFU (TPN) complete in all respects.	No.	1			
E6	Supply, Erection & commissioning of Aviation obstruction lights:					
	a) LOW INTENSITY TYPE B AS PER ICAO, LED TYPE WITH 20 YEARS MAINTENANCE FREE LIFE, including all accessories, controller etc complete in all respects	No.	12			

SIGNATURE OF BIDDERS WITH SEAL

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
	b) MEDIUM INTENSITY TYPE B AS PER ICAO, LED TYPE WITH 20 YEARS MAINTENANCE FREE LIFE,including all accessories, controller, flasher etc complete in all respects	No.	12			
E7	Supply, Erection & commissioning of Flood light with 250W HPSV lamps with controlgears & accessories etc. complete in all respects.	No.	4			
E8	a)Supply, Erection & commissioning of well glass type luminaries with 70W/HPSV lamp with controlgears & accessories etc. complete in all respects.	No.	70			
	(b) Supply, Erection & commissioning of Well glass type luminaries with 150W/HPSV lamp with controlgears & accessories etc complete in all respects.	No.	10			
E9	Supply, Erection & commissioning of 63Amp welding switch socket with plug & other Mounting accessories etc complete in all respects.	No.	8			
E10	Supply, Erection & commissioning of 3 pin, 1 Ph, 240V,15Amp. Power sockets complete with plug Switches etc.	No.	16			
E11	Supply, Erection & commissioning of Aluminum conductor, PVC insulated, Armoured, , PVC outer sheath, FRLS type 1100V grade conforming to IS-1554 Part I.					
	a. 3½ C x95mm² Al conductor for connection between ACDB/ELDB/ welding sockets	RM	550			
	b. 3½ Cx35mm² Al conductor for Lighting panel incoming supply	RM	550			
	c. 3½ Cx16mm² Al conductor for Lighting panel incoming supply	RM	800			
E12	Supply, Erection & commissioning of PVC insulated 650/1100V grade stranded Cu Conductor lighting wires conforming to IS-694.					

SIGNATURE OF BIDDERS WITH SEAL

**BHEL: PS-WR NAGPUR
TS NO : BHE/PW/PUR/UKT-CHIMNEY/612**

PRICE BID- PART-II (VOL-III)

Item No.	DESCRIPTION	Unit	Quantity	Rate in Rs (In Figure)	Rate in Words	Amount
	(a) 2.5 mm ²	RM	2000			
	(b) 4.0 mm ²	RM	1500			
E13	Supply, Erection & commissioning of GI conduit 25mm dia with junction Boxes, Pull boxes & accessories etc. complete in all respects.	RM	1200			
E14	Supply, Erection & commissioning of Lightning protection Air terminal	RM	64			
E15	Taking delivery of earthing rod / GI flats from BHEL stores, cutting, bending, fabricating/welding, laying and testing Earthing materials etc. complete as per drawing and specifications.					
	(a) Below Ground earthing system	RM	20			
	(a) Above Ground earthing system	RM	750			
E16	Supply, Erection & commissioning of Galvanized Steel cable trays, Including cover and accessories etc. Complete as per drawing and specifications. Cable trays shall be of ladder type constructed of minimum 2 mm thick mild steel hot dip galvanised.					
	A) 600 mm wide	RM	50			
	B) 300 mm wide	RM	150			
	C) 150 mm wide	RM	400			
E17	Supply, Erection & commissioning of Aviation distribution board (ADB) with one 32A SFU(TPN) incomer and 6 nos. SP 20A MCB. Construction is same as LP	No.	4			
E1v1	Supply, Erection & commissioning of Elevator- climb 275m External with all accessories cabling, drive, control device etc. complete as per Tech. specification no. PE-TS-294-620-C001 Vol. II sheet 27 of 304 for chimney elevator.	LS	1			
	SUB TOTAL FOR RATE SCHEDULE - B (ELECTRICAL WORKS)					
	Grand Total (A+B)					
	In word Rs.					

SIGNATURE OF BIDDERS WITH SEAL