

TENDER SPECIFICATION

NO: BHE/PW/PUR/SKT-CHIMNEY/908

**CONSTRUCTION OF TWIN FLUE RCC CHIMNEY OF HEIGHT 220M WITH BRICK LINERS USING
SLIPFORM SHUTTERING EQUIPMENT ETC**

AT

**SIKKA THERMAL POWER STATION (EXPANSION PROJECT)
GUJARAT STATE ELECTRICITY CORPORATION LIMITED
SIKKA, DISTT. JAMNAGAR (GUJARAT)**

VOLUME III (PRICE BID SPECIFICATION)

BHEL PSWR
T.S.No BHE/PW/PUR/SKT-CHIMNEY/908
VOLUME III PRICE BID SPECIFICATION
BOQ / SOQ for Construction of RCC Multi Flue Brick Lined RCC Chimney of 220 m high
at
2X250MW T.P.S. GSECL SIKKA (Gujarat)

SL.NO	DESCRIPTION OF ITEMS.	UNIT	QTY.	RATE (Rs) In figures	RATE (Rs) In Words	AMOUNT
1	(i)Excavation for all lifts, in all types of soils including Ash, laterite, murrum, weathered rock, decomposed rock and soft rock which includes providing of cofferdams, shoring, strutting, sheeting, bracing, draining and pumping out water below ground water table, if required; clearing all grass, vegetation, etc. including trimming of excavation bottom, stacking, levelling, grading etc. of excavated materials all complete as per specifications and drawings and instructions of the Engineer including a lead upto 200 metres.					
	a) For depth upto 2 metre	CUM	3500.00			
	b) For depth from 2 to 4 metre	CUM	3000.00			
	c) For depth from 4 to 6 metre	CUM	1250.00			
	d) For depth from 6 to 8 metre	CUM	200.00			
	(ii) Same as above but excavation in Hard rock which requires chiesling, controlled blasting(including provision of sensor to assess the impact of blast on the adjacent structures.), wedging etc.					
	a) for depth upto 2 metre	CUM	100.00			
	b) For depth from 2 to 4 metre	CUM	300.00			
	c) For depth from 4 to 6 metre	CUM	1325.00			
	d) For depth from 6 to 8 metre	CUM	1500.00			
	iii) 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 upto filling or testing, all complete as specifications and instructions of the Engineer.	CUM	2000.00			
2	Disposal of surplus excavated earth/rock beyond an initial lead of 200m included in item no. (1) above in/outside of the plant at the area earmarked by BHEL/ Customer for the following lead, dumping & levelling the soil/rock at disposal yard and levelling the area from where the material is transported complete with all lift					
	a) Carriage beyond initial lead of 200m but not exceeding 2KM or part thereof	CUM	500.00			
	b) Carriage beyond initial of 200m but not exceeding 3KM or part thereof	CUM	500.00			
	c) Carriage beyond initial of 200m but not exceeding 4KM or part thereof	CUM	500.00			
	d) Carriage beyond initial of 200m but not exceeding 5KM or part thereof	CUM	2500.00			
3	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	CUM	4000.00			

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	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.	CUM	3500.00			
4	Supplying and laying (inside chimney in the space below the grade level slab) crushed rock and sand fill in layers not more than 150 mm thick each and thoroughly compacted by mechanised compaction machine or manually and by water flooding to achieve maximum density for all leads and lifts including all labour, materials, equipment, loading, unloading, cost of sand, transporting etc. complete as per drawings, specifications and directions of the Engineer.	CUM	800.00			
5	Providing and laying Nominal Mix plain cement concrete of grade M20 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.	CUM	150.00			
6	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 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-35 (foundations, etc) (with minimum cement content as 450 kg/m ³).	CUM	4400.00			
	ii) For works above ground level					
	a) Grade M-20 (grade level slab) with minimum cement content as 360 kg/m ³	CUM	60.00			
	b) Grade M-30 (with minimum cement content as 450 kg/m ³) for chimney shell, roof and external platforms and minishell, other shell attachments.	CUM	8100.00			
	c) Grade M-25 (with minimum cement content as 410 kg/m ³) for internal platform slab, enclosure wall, slab or any other component.	CUM	50.00			
7	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. CRS Reinforcement/TMT bars (corrosion resistant steel) shall be supplied by BHEL free of cost.					
	i) For works below ground level					
	a) CRS (Corrosion Resistant Steel) Reinforcement bars of Grade Fe 500 grade as per specifications	MT	400.00			
	ii) For works above ground level					
	a) Mild steel reinforcement bars	MT	10.00			

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	b) CRS Reinforcement(Corrosion Resistant Steel) bars of Grade Fe 500 grade as per specifications	MT	600.00			
8	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	750.00			
	ii) For works above ground level					
	a) Inner and outer faces of wind shield with slip form shuttering	SQ.M	23000.00			
	b) All other components of the superstructure including slabs, beams, columns, walls, enclosures, mini shells, external plat- forms, corbels, other shell attachments, chases/recesses in shell etc.	SQ.M	3200.00			
9	Providing and fixing formwork in shell openings (above 0.1sq.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	50.00			
10	Preparing detailed fabrication drawings and after approval by the 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.	MT	2.00			
11	Preparing detailed fabrication drawings and after approval by the Engineer supplying, fabricating and erecting of steel staircase (with tubular hand railing and grating treads and landings) from grade level to roof level including brackets along with fittings and fixtures, posts, kick plates, including transporting, lifting, setting material in place and welding to cast-in-fixing plates with cost of all labour, cutting, grinding, drilling, bolts and bolting, anchor fasteners, grouting, welding, pre-heating of welded joints, testing, Surface preparation by means of Shot Blasting near white metal surface(Sa 2 1/2) as per specifications, primer and final finish painting with Acid, Heat and Corrosion resistant Paint as per IS 158 with overall DFT of 190 micron or chlorinated rubber finish paint of approved make and colour in coats of minimum 50 micron DFT with overall DFT of 150 micron complete as per specifications.					
	a) 32 mm nominal bore medium class MS handrailing (Including supply of materials by bidders)	MT	8.00			
	b) Stair gratings with antislip nosings and landing platform gratings (including supply of materials by bidders)	MT	8.00			
	c) Main structural members (Structural steel supplied by BHEL Free of Cost)	MT	40.00			

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SL.NO	DESCRIPTION OF ITEMS.	UNIT	QTY.	RATE (Rs) In figures	RATE (Rs) In Words	AMOUNT
12	Preparing detailed drawings and after approval by the Engineer, supplying, fabricating and erection of galvanised steel strakes at all levels alongwith fittings and fixtures including transporting, lifting, setting material in place, embed- ding 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, Surface preparation by means of Shot Blasting near white metal surface(Sa 2 1/2) as per specifications, priming and final finish painting with Acid,Heat and Corossion resistant Paint as per IS 158 with overall DFT of 190 micron or chlorinated rubber finish paint of approved make and colour in coats of minimum 50 micron DFT with overall DFT of 150 micron complete as per drawings, specifications, and the direction of the Engineer.	MT	10.00			
	(i) Taking delivery of structural steel from BHEL stores and transporting to site, preparing detailed fabrication drawings and after approval by the Engineer fabricating and erecting structural steel lintel beams and buckstays for liners and structural steel floors at various levels complete including structural members, beam support bearings on the shell, stiffeners, brackets along with other fittings and fixtures including transporting, blockouts, lifting, setting material in place, high strength grout, grouting, HT bolts & bolting, anchor bolts, welding to cast-in fixing plates with cost of all labour, cutting, grinding, grinding smooth the support bearing plates, pre-heating or post-heating of welded joints, testing, Surface preparation by means of Shot Blasting near white metal surface(Sa 2 1/2) as per specifications, primer and final finish painting with Acid,Heat and Corossion resistant Paint as per IS 158 with overall DFT of 190 micron or chlorinated rubber finish paint of approved make and colour in coats of minimum 50 micron DFT with overall DFT of 150 micron .	MT	750.00			
	contd... Major structural steel sections and plates shall be supplied by BHEL free of cost whereas fasteners, bolts, anchors, nuts and grouting shall be in the scope of contractor.HT/MS Bolts shall be paid seperately under item no.12(ii) & item no.12(iii) below.					
	ii) Supplying and fixing in position of permanent mild steel bolts (class 4.6 as per IS : 1367 and grade 'C' as per IS: 1363) and nuts, washers etc. up to and inclusive of 39 mm diameter and upto 300mm long for structural steel work complete as per specification, drawings and instructions of the Engineer.	Quintal	15.00			
	iii) Supply and fixing in positng of high strength structural bolts (of property class 8.8 and product grade 'C' as per IS: 1367) and conforming to IS: 3757 and high strength structural hardened and tempered nuts (of property class '8' as per IS:1367) conforming to IS:6623 with hardened and tempered washers as per IS:6649 etc. up to and inclusive of 39 mm diameter and upto 300 mm long for structural steel work complete as per specification, drawings and instructions of the Engineer.	Quintal	50.00			
13	Supplying, fabricating and placing in position, bearing plates and bearing bars of stainless steel (of grade AISI 316L) under the platform beams and over the mild steel bearing supports (to give a sliding surface) including the cost of all labour, material, drilling, welding of stainless steel using compatible special electrode, machining flat and polishing the contact surfaces of stainless steel, coating the polished surfaces with silicon grease, etc., complete as per drawings and specifications.	Kg	200.00			
14	Supplying, fabricating and placing in position (at the beam supports bearings) 3mm thick lead sheets between the stainless steel and mild steel components of the bearing including the cost of all labour, materials, cutting to shape, grinding, drilling etc., complete as per drawings and specifications.	KG	25.00			
15	Supplying, and placing in position(at the beam supports bearings) Neoprine pads between concrete surface and mild steel including the cost of all labour materials, cutting to shape, grinding, drilling etc.,complete as per drawings and specifications	CU.M	1.75			

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SL.NO	DESCRIPTION OF ITEMS.	UNIT	QTY.	RATE (Rs) In figures	RATE (Rs) In Words	AMOUNT
16(A)	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 cost of all leads and levels, 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.	CuM	710.00			
16(B)	Supplying and laying in position shaped/curved acid resisting bricks (conforming to Class-II/ of IS:4860) for liners at all elevations having strength not less than 50/ N/sq.mm.with potassium silicate type chemical resistant mortar including the cost, for all leads and levels, 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.	CuM	600.00			
17	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	41.00			
18	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 Engineer, in 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 net ting, 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	600.00			
19	Supplying,fabricating and installing chemical lead sheet (2 mm thick) at expansion joints between lining segments at all elevations and at the liner basin including the cost of all labour,transportation, materials, soldering of joints, etc. complete as per drawings and specifications.	MT	3.00			
20	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	40.00			
21	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	15.00			
22	Supplying and painting the entire inner surface and part external surface of the chimney shell , external surface of minishells, platform slabs, air tight enclosures and wherever as directed by the Engineer over concrete or masonry with acid and heat resisting black bitumastic paint (conforming to type I(i) of IS:158) in as many number of coats (not less than four coats) as required to give a paint DFT of not less than 150 microns including the cost of all labour, materials, equipment for handling and cleaning, protecting and cleaning etc. complete as per drawings and specifications.	SQ.M	11000.00			

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SL.NO	DESCRIPTION OF ITEMS.	UNIT	QTY.	RATE (Rs) In figures	RATE (Rs) In Words	AMOUNT
23	Supplying and painting the external surface of the chimney shell at any elevation,including the cost of all labour, materials,equipment for handling and cleaning,protecting and cleaning etc. complete as per drawings and specifications:					
	a)One coat of cement primer and two finish coats of heat and acid resistant polyurethane paint in alternate bands of colour signal red and pure/bright white as per manufacturer's specification and approval of Engineer.	SQ.M	2450.00			
	b)Three coats of Synthetic enamel paint conforming to IS: 2932/2933 alternate bands of colour signal red and pure/bright white as per mfr's specification & approval of Engr.	SQ.M	11400.00			
24	Supplying and painting the internal surface of the mini shells, top of acid resisting bricks over the roof, slab surface under the brick liners and wherever as directed by the Engineer at any elevation, for acid and heat protection, using coal tar epoxy paint in atleast two coats over a thin coat of the same paint as required to give a paint DFT of not less than 230 microns, including the cost of all labour, materials, equipment for handling and cleaning,protecting and cleaning,etc. complete as per drawings and specifications.	SQ.M	190.00			
25	Supplying and laying on the roof, 75 mm thick acid resisting bricks(conforming to Class-I of IS:4860) with potassium silicate mortar over a bed of the same mortar including the cost of all labour, materials and equipment, preparing concrete,laying under bed of sand-cement screed to slopes, painting with black bitumastic paint, 2 layers of 6 mm thick bitumenmastic,10mm thick acid resisting cement bed and bricks, pointing with phenolic based acid resisting cement,protection and cleaning, providing movement control joints with flexible sealants, providing building paper, etc. complete as per drawings and specifications.	SQ.M	154.00			
26	Conducting load testing on girders for 1.25 times the full load, on ground , including provision of test bed and jacks, dial gauges and other supplies complete as per specification and drawings and approval of engineer in-charge.	Pair	21.00			
27	Providing and constructing a 1100 mm deep hood drain basin with M-30 grade RCC, with 200 mm thick side walls and bottom slab and of over all plan dimensions 1100 mm x 800 mm and supplying an aluminium painted 6 mm thick chequered plate cover (for the drain basin) of plan dimensions 1124 mm x 824 mm with a lipping of 50 mm all-around including the cost of all labour and materials,excavation in all types of soil with sheeting and shoring if necessary, bailing out water to keep the pit dry during the complete underground works, all formwork,connecting/casting the C.I rain water drain pipe from the chimney and the CI drain pipe to the plant drain, as per drawings and specifications.	each	1.00			
28	Supplying and installing at the base of the chimney shell, a gear operated steel grill type roll up door complete with guides, hood,hardware,weather baffles, combination end locks and wind locks, fasteners,frames,all mechanisms and accessories as required for proper operation and weather protection including all labour, painting etc. as per drawings and specifications	each	1.00			
29	Supplying, fabricating and installing at the base of chimney shell & at platforms, mild steel personnel access door complete with locking arrangements and all other fittings and fixtures, fasteners including the cost of all painting etc.complete as per drawings and specifications.	each	5.00			

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30	Supplying, fabricating and installing at the airtight enclosures sound deadened and insulated personnel access doors (which shall bear against seals under the pressure created by annulus pressurisation) complete with frames, locking arrangements, hardware, anchors, insulation, neoprene, pressure release mechanism and all other mechanisms and accessories required for proper operation including all labour, painting etc. complete as per drawings and specification.	each	5.00			
31	Supplying, fabricating and installing mild steel hatches at various locations in the chimney system complete with locking arrangements, frames, insulation, fittings and fixtures and all mechanisms and accessories reqd for proper operation including all labour, painting etc. complete as per drawings and specifications.					
	a) Hood Access Hatch	each	1.00			
	b) Equipment Hatch	each	1.00			
	c) Liner Access Hatch	each	20.00			
32	Supplying, sampling and gas opacity fabricating and installing in the liners, gas measurement ports made from cast iron pipe including the cost of all labour, materials, bolts and plates & all other accessories, painting etc., complete as per drawings and specifications.	ITEM	6.00			
33	Supplying, fabricating and installing in the liners, gas sampling and gas opacity measurement ports made from SS steel(316L) including the cost of all labour, materials, bolts and bolting, asbestos gaskets, cover plates & all other accessories, painting etc., complete as per drawings and specifications.	each	6.00			
34	Supplying, fabricating and installing on top of the mini shells, 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 labour, painting, etc. complete as per drawings and specifications.	MT	3.50			
35	Supplying, fabricating and installing at various locations and elevations of the chimney systems 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					
	a) Mild steel ladders with cage, inside and outside the chimney, vent covers & guides, bird screens and other miscellaneous steel not specifically mentioned.	MT	2.00			
	b) 32 mm nominal bore medium class MS hand railing (for internal and external platforms)	MT	2.00			
36	Providing, fitting & fixing, outlet and overflow, cast iron roof drain heads (with gratings) in chimney roof including sockets, adapters, brackets, hangers, supports, etc., casting-in and jointing to 150 mm nominal bore rainwater pipes, grouting, etc. including the cost of all labour material and equipment, transporting, lifting, setting in place, painting, etc. complete as per drawing and specifications.	each	8.00			

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37	Providing, fitting and fixing rainwater pipes at all levels internally from the chimney roof to ground level upto the hood drain basin including shoes, bends, junctions, flanges,hoppers, sockets, adaptors, brackets, hangers, supports, anchor fasteners, spacers, pipe sleeve through shell, silicon or vulcanised butyl sealant, foam backing material, jointing, socketing, grouting, caulking, primer and finish painting etc. complete including the cost of all labour, material and equipment, complete as per drawing and specifications:					
	a) 150 mm dia. cast iron pipes	RM	50.00			
	b) 150 mm dia. GI pipes	RM	400.00			
38	Providing, supplying, and laying metallic hardner flooring such as ironite flooring of minimum 50 mm thickness including preparation of base, laying underbed, finishing, rounding corners, curing, filling the gaps between the slab and chimney shell and pedestals through the slab with 15 thick asphalt etc. with all labour, materials, equipment, handling etc. as per drawings, specifications and instructions of the Engineer.	SQM	415.00			
39	Providing, supplying and painting exposed surface of substructure (below ground concrete surface in the direct contact of earth) for protection of concrete work by adopting following painting system					
	1.Concrete Penetrating Bipolar Corrosion Inhibitor (CPCI)	SQM	1500.00			
	2.Epoxide Resin Based Paint (ERBP) with all labour, materials, equipment, handling etc. as per drawings, specifications and instructions of the Engineer.	SQM	1500.00			
40	Providing 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.	314.00			
41	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 all complete excluding plastering and painting. Using bricks of class designation 7.5 of nominal demensions as per specification.	Cu.M.	10.00			
42	Providing 15 mm thick plaster in cement mortar 1:6 on walls, finished to a smooth finish as per specification.	SQ.M.	75.00			
43	Providing, fabricating and laying in position asbestos mill boards, over the mini shells below the cast iron cap segments, in between the cap segments and wherever as directed by the engineer, including the cost of all labours, material and equipment, cutting, drilling, etc., complete as per drawings and specifications.					
	(a) 25 mm thick asbestos mill boards	SQ.M	145.00			
SL.NO	DESCRIPTION (SUPPLY, ERECTION & COMMISSIONING OF ITEMS)					
E-1	Supply, erection and 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			

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E-2	Supply erection and commissioning of 415V, 200A, 4 wire AC Emergency Lighting distribution board along with 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			
E-3	Supply, erection and commissioning of Normal AC lighting panel outdoor type with degree of protection IP 55 with one no. 100A SFU (TPN) Incomer , (a)18 outgoing (16A SP MCBs)	No.	2			
	(b)12 outgoing (16A SP MCBs)	No.	2			
E-4	Supply, erection and 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)	No.	2			
E-5	Supply, erection and 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), photodetector and timer circuit along with 100A contactor to control Aviation lighting systems	No.	1			
E-6	Supply, erection and 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			
	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			
E-7	Supply, erection and commissioning of Flood light with 250W HPSV lamps with all control gears & accessories	No.	4			
E-8	Supply, erection and commissioning of Well glass type luminaries with 70W/HPSV lamp with all control gears & accessories etc .	No.	70			
E-9	Supply, erection and commissioning of Well glass type luminaries with 150W/HPSV lamp with all control gears & accessories.	No.	50			
E-10	Supply, erection and commissioning of 63Amp welding switch socket with plug & other Mounting accessories .	No.	22			
E-11	Supply, erection and commissioning of 3 pin, 1 ph, 240V, 15Amp. Power sockets complete with plug Switches etc.	No.	23			
E-12	Supply, erection and commissioning of Al conductor, PVC insulated, Armoured , PVC outer sheath, FRLS type 1100V grade conforming to IS-1554 Part I.					
	a. 3½ C x 95mm ² Al for connection between ACDB/ELDB/ welding sockets	Meters	1100			
	b. 3½ C x 35mm ² Al for Lighting panel incoming supply	Meters	1000			

BHEL PSWR
T.S.No BHE/PW/PUR/SKT-CHIMNEY/908
VOLUME III PRICE BID SPECIFICATION
BOQ / SOQ for Construction of RCC Multi Flue Brick Lined RCC Chimney of 220 m high
at
2X250MW T.P.S. GSECL SIKKA (Gujarat)

SL.NO	DESCRIPTION OF ITEMS.	UNIT	QTY.	RATE (Rs) In figures	RATE (Rs) In Words	AMOUNT
	c. 4Cx16mm ² Al conductor, PVC insulated, Armoured, PVC outer sheath, FRLS type 1100V grade conforming to IS-1554 Part I.	Meters	1200			
E-13	Supply, erection and commissioning of PVC insulated 650/1100V grade stranded Cu Conductor lighting wires conforming to IS-694.					
	a. 2.5 mm ²	Meters	3000			
	b. 4.0 mm ²	Meters	6000			
E-14	Supply erection and commissioning of GI conduit 25mm dia with junction Boxes,Pull boxes & accessories etc.	Meters	5000			
E-15	Supply, erection and commissioning of Lightning protection Air terminal.	Meters	25			
E-16	Supply, erection and laying of Earthing materials etc., complete as per drawings and specifications.					
	(a) Below ground earthing system	RM	200			
	(b) Above ground earthing system	RM	1200			
E-17	Supply, erection and commissioning of GS cable trays. Cable trays shall be of ladder type constructed of minimum 2 mm thick mild steel hot dip galvanised.					
	a. 600 mm wide	Meter	150			
	b. 300 mm wide	Meter	150			
	c. 150 mm wide	Meter	100			
E-18	Supply erection and commissioning of Aviation distribution board (ADB) with one 32A SFU(TPN) incomer and 6 nos. SP 20A MCB. Construction is same as LP	No.	2			
E-19	Supply, erection and commissioning of Telephone socket with junction box etc., complete as per drawings and specifications.	Nos.	10			
E-20	Supply, installation and commissioning of Telephone hand sets etc., complete as per drawings and specifications.	Nos.	10			
E-21	Supply and laying of Telephone cables etc., complete as per drawings and specifications.					
	(a) 24 pairs	RM	150			

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SL.NO	DESCRIPTION OF ITEMS.	UNIT	QTY.	RATE (Rs) In figures	RATE (Rs) In Words	AMOUNT
	(b) 4 pairs	RM	300			
E-22	Supply, installation and commissioning of Photo electric light detectors including necessary accessories and related works etc. complete as per drawings and specifications.	Nos.	4			
E-23	Designing, Supplying, Erection and Commissioning of Rack and Pinion Type Stack Elevator from ground floor upto top of chimney with necessary foundations, landing at various platform level etc complete as per specifications and drawings as approved by engineer- in-charge.	LUMPSUM	1			
TOTAL AMOUNT (Rs) In Figures						
TOTAL AMOUNT (Rs) In Words						