	PART-B
	PREAMBLE FOR BOQ CUM RATE SCHEDULE
1	Details of the items in the BOQ Cum Rate Schedule shall be read in conjunction with the tender specifications, drawings and other documents and shall have precedence over any contrary statement mentioned anywhere in this document.
2	The work shall be carried out as per construction drawings, specifications, the description of the items in this schedule and/or Engineer's instructions, Drawings enclosed with these documents are only indicative giving some idea of the type of work involved. The layout, sizes and details of the building, structures and foundations shown in tender drawings may vary at a large extent during actual construction. Final drawings will be issued progressively during the execution of the work.
3	Items of work provided in this schedule but not covered in the specifications shall be executed strictly as per instructions of the Engineer.
4	Unless specifically mentioned otherwise in the contract, the contractor shall quote his rates for the finished items and shall provide for the complete cost towards fuel, tools, tackle, equipment, constructional plant, temporary works, labour materials, levies, taxes, transport, layout, repairs, rectification, maintenance till handing over, supervision, shops, establishments, services, temporary roads, revenue expenses, contingencies, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the works according to the contract.
5	The rate shall also be inclusive of carrying out topography survey of site to establish levels and coordinates at suitable intervals, form existing grid levels and coordinates furnished by the owner, establish bench marks, setting out the location and levels of the proposed structures, constructions and making references, pillars and other identification marks etc. No separate payment will be made towards the same.
6	The quantities of the various items mentioned in the BOQ cum Rate Schedule are approximate and may vary up to any extent or be deleted altogether. The overall variation in contract value on execution shall be dealt as per GCC. Contractor has to obtain prior approval of BHEL/ Customer before procurement of bought out items/ building materials.
7	BHEL Engineer's decision shall be final and binding on the contractors regarding clarification of items in BOQ cum Rate schedule with respect to the other sections of the contract.
8	In case of any discrepancy between item description, relevant specification, clarification shall be sought at tender stage itself. Otherwise it shall be assumed that the contractor has quoted for the more stringent requirement.

PART-A

2X800MW DVC KODERMA (KTPS) PHASE-II

Summary (Un-Priced Rate Schedule)

Sl. No.	Item Description	Quantity	Units	Quoted Currency in INR / Other Currency	BASIC TOTAL AMOUNT In Figures To be entered by the Bidder Rs. P	TOTAL AMOUNT (For taxes refer Chapter-VIII of TCC) Rs. P	TOTAL AMOUNT In Words
1	2	3	4	5	6	7	8
1	**TOTAL PRICE FOR ENTIRE SCOPE OF WORK AS PER TENDER NO. BHEL/CPC/KOD/CHM/25/096** CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, SUPPLY, FABRICATION & ERECTION OF STEEL FLUE CANS, ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND	1.00	Total Price	**INR**		-	
Total in Figures						-	
Quoted Rate in Words							

Instructions to the Bidders

1	**Bidders shall quote Total Price for the entire scope of work in Rupees in VOL II PRICE BID at BHEL E-procurement Portal.** Any other entry elsewhere in the offer of the bidder shall be treated as Null and Void. The total value shall be automatically calculated on E-portal.
2	Contract Value based on the price quoted by Bidder in Price Bid shall be as per Part-B.
3	BHEL has fixed the % weightages as in "Part-B" for the amount of individual items of BOQ Cum Rate Schedule w.r.t. the total value quoted in price-bid.
4	Based on the pre-fixed % weightages, amount of individual items shall be derived by BHEL. This amount shall not be rounded off.
5	Based on the quantities of individual item and the amount arrived in Sl. No. 4 above, item rate of individual items shall be derived by BHEL. This item rate shall be rounded off up to two decimal places and shall be used to calculate the total amount of an item.
6	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 serial no. 5 above.

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

BOQ CUM RATE SCHEDULE (% WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS W.R.T. THE TOTAL VALUE)

TENDER NO.: BHEL/CPC/KOD/CHM/25/096

CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, SUPPLY ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND

SL No.	Civil Works	Unit	Quantity	RATE (INR)= TOTAL VALUE * WEIGHTAGE /(QUANTITY) (ROUNDED OFF TO TWO PLACES AFTER DECIMAL)	AMOUNT (INR) RATE * QUANTITY	WEIGTHAGES OF BOQ ITEMS
1	Earth work in excavation in all types of soil including ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1Km, spreading/levelling of disposed materials etc all complete for following depths below ground level, including all labour, equipments etc complete as per specification, drawing and as directed by engineer- in-charge					
a	Depth from ground level but not exceeding 2 m	cum	100			0.0016310328%
b	Depth exceeding 2 m but not exceeding 4 m	cum	100			0.0020429098%
c	Depth exceeding 4 m but not exceeding 6 m	cum	100			0.0025536373%
7	Earthwork in Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 300mm compacted thickness using/with selected materials from compulsorily excavated earth available within a lead upto 1 Km and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following, including all labour, equipments etc complete as per specification, drawing and as directed by engineer- in-charge.					
b	at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	19500			0.3148387609%
8	Earthwork in Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 300 mm thickness using/with selected earth directly from excavation within a lead upto 1Km and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following, including all labour, equipments etc complete as per specification, drawing and as directed by engineer- in-charge.					
b	at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	1950			0.0266649155%
A11	Supplying and filling natural sand / sand manufactured from other than natural sources upto any depth below grade slab, under floors, around foundations, plinths etc. in layers not exceeding 300mm compacted thickness and compacted so as to achieve at least 80% relative density as per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any), labour, equipments etc. all complete as per specification, drawing and as directed by engineer- in-charge.	cum	50			0.0229580227%
12	Providing and Filling in grade slab, area paving, trenches, plinths and other underground structures with graded stone aggregate of size range 63 mm to 45 mm in layers not exceeding 200 mm in thickness including breaking of stone boulders to required sizes, filling the interstices with selected natural sand/sand manufactured from other than natural sources/moorum and compacting to 85 % of original volume of stone stack for all lifts etc. all complete as per specifications, drawings and instructions of the Engineer. Payment shall be made for the measurement of the volume of the compacted fill.	cum	260			0.1387432308%
13	Providing and laying Nominal Mix plain cement concrete (M7.5) 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.**(Cement supply in contractor's scope as per TCC)**	cum	100			0.1045838019%
14	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: **(Cement supply in contractor's scope as per TCC)**					
i	For all works below ground level (excluding chimney shell)					
a	Grade M-25 (foundations, etc) **(Cement supply in contractor's scope as per TCC)**	cum	15			0.0197280834%
b	Grade M-30 (foundations, etc) (Cement supply in contractor's scope as per TCC)	cum	15			0.0202445772%
ii	For all other works					
a	Grade M-25 grade level slab, pit, trenches,drain etc. **(Cement supply in contractor's scope as per TCC)**	cum	200			0.2630411124%
b	Grade M-30 for chimney shell, corbel, external platforms, roof slab and any other components. **(Cement supply in contractor's scope as per TCC)**	cum	95			0.1476546011%
c	Grade M-35 for chimney shell, corbel, external platforms, roof slab and any other components. **(Cement supply in contractor's scope as per TCC)**	cum	17950			28.1177867893%
15	Providing and applying **two coats of bitumen grade 85/25** as per IS 702 (@ 1.7kg/sqm) with 1% antistripping compound conforming to IS 6241 in foundation, shell, pedestal etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete as per specifications, drawings and instructions of the Engineer.	Sqm	1100			0.0427693053%
16	Providing and placing steel reinforcements of **High yield strength deformed TMT steel bars of grade Fe-500/Fe-500D/Fe-550/Fe-550D** conforming to IS:1786 and IS 13920 (minimum elongation shall be 14.5%) , 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, equipment, handling, testing, transportation to & from stores etc., preparation of bar bending schedules, all complete as per specification, drawing and as directed by engineer- in-charge.					
i	For works below ground level **(excluding shell)**					
a	High strength deformed bars **(TMT steel will be provided by BHEL free of cost as per TCC)**	MT	2			0.0039476299%

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

BOQ CUM RATE SCHEDULE (% WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS W.R.T. THE TOTAL VALUE)

TENDER NO.: BHEL/CPC/KOD/CHM/25/096

CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, SUPPLY ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND

ii	For works other than those under Sl. No. 16(i)					
a	Mild steel reinforcement bars **(Mild steel supply in contractor's scope)**	MT	2			0.0277071290%
b	High strength deformed bars **(TMT steel will be provided by BHEL free of cost as per TCC)**	MT	2007			5.5460256333%
17	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, tieing, 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 **(excluding shell)**	Sqm	150			0.0173638272%
ii	For works other than those under Sl. No. 17(i)					
a	**Inner and outer faces of wind shield with slip form shuttering:** Providing and fixing formwork using slipform (inner and outer faces) for concreting in chimney for cast in situ, reinforced concrete works of any type and section for all elevations, including labour, materials, equipment, waste of forms, scaffolding, staging, tieing, nailing, caulking, bolting, mantainence, dismantling etc. all complete as per specifications, drawings and instructions of Engineer in charge. (Area of inner face and outer face shall be measured seperately.) **Note:- To prevent surface problem in RCC Chimney Shell, 0.47 mm thick colour coated GI sheet should be used along with Slipform shutter plate as per direction of BHEL In-Charge.** **Mode of Measurement:- Total formwork quantity in chimney applicable to Slipform work as per specifications & drawings shall be jointly measured and certified. Certified quantity(SQM) to be paid in line to the unit rate of 17a) i), 17a) ii) & 17a) iii). (The slipform arrangement material shall be the property of contractor)**					
a i)	For Mobilisation & Installation (One Time Payment of the total certified quantity shall be made for mobilisation of slipform only after start of successful slipping as certified by Engineer in charge.)	Sqm	50100			5.2850042857%
a ii)	For Dismantling of the Slipform System (One Time Payment of the total certified quantity shall be made only after complete dismantling of slipform as certified by Engineer in charge.)	Sqm	50100			1.3256360167%
a iii)	Slipping/Providing formwork at inner and outer faces of wind shield with slip form shuttering with slipform arrangement. (Cost for design, mobilisation, installation & dismantling of slipform shall be paid seperately in Item No 17 a i) & 17 a ii) and cost for slipping/providing & mantainence of slipform work to be paid in this item). Measurement for payment to be done progressively as per actual slipping executed at site.	Sqm	50100			6.6105164922%
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.	Sqm	160			0.0382961236%
18	Providing and fixing formwork in shell openings and pockets **(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.	Sqm	985			0.2357605108%
19	Providing and placing in position at all levels, **building paper (kraft paper)**, as per IS:1397, between concrete surfaces incluing the cost of labour, material, etc. complete as per drawings and instruction of the Engineer.	Sqm	95			0.0002809413%
20	Providing and installing, at all levels, **bitumen impregnated fibre boards**, 12 mm thick, conforming to IS:1838, as joint filler at joints in concrete, including nailing, coating of both faces with coal tar pitch/bitumen, including the cost of all labour, material and equipments etc., complete as per drawings, specifications and instructions of the Engineer.	Sqm	45			0.0046686832%
21	Providing and filling, at all levels, **bitumen sealing compound (hot applied type)** conforming to IS:1834, for sealing gaps and joints in concrete, including cleaning, mixing, heating, pouring or injecting, appllication of primer, cost of all labour, material and equipments etc., complete as per drawings, specifications and instructions of the Engineer.	Kg	600			0.0124284701%
22	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 preparation of fabrication drawings, galvanization as per IS:4736 (The minimum weight for galvanizing shall be 610 g/sq.m and shall comply with relevant IS Codes), 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	4			0.0685227864%

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

BOQ CUM RATE SCHEDULE (% WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS W.R.T. THE TOTAL VALUE)

TENDER NO.: BHEL/CPC/KOD/CHM/25/096

CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, SUPPLY ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND

B23	**Supply, f**abrication **(shop fabricated as per specification)** and **erection o**f structural steel of grade E 250 in rolled/ built up section (Rolled sections shall be of grade designation E250, Quality A/BR, Semi-killed/ killed conforming to IS 2062. All steel plates shall be of Grade designation E250, Quality BR (fully killed), conforming to IS 2062 and shall be tested for impact resistance at room temperature. Plates beyond 12mm thickness and up to 40mm thickness shall be normalized rolled. Plates beyond 40mm thickness shall be vacuum degassed & furnace normalised and shall also be 100% ultrasonically tested as per ASTM –A578 level B-S2.) in chimney platform, staircase, columns, beams, struts, monorails, stays, safety chains, ladders, MS gratings, gantry girders, roof trusses, portals, laced purlins, space frames, hangers, wall beams, sheeting runners, brackets, stiffeners, stub columns, bracings, cleats, base plates, splice plates,gussets, end plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs,stringers, treads, landings, decking and seal plates, galleries etc including blast cleaning, providing & applying primer,providing and applying intermediate, final and final finish coat of paint (blast cleaning,primer and paint shall be paid separately as per item no C23, D23 & E23), connection design, preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, true to line, level, plumb & dimension, erection bolts & nuts (weight of erection bolts and nuts not payable), assembly, edge preparation, preheating / post heating if required, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface preparation by means of manual or mechanical power tools as per IS:1477 part 1, touch-up painting, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), etc all complete as per drawing and specifications.	MT	845			16.0187437713%
C23	Extra over ST NO. A23, B23, A24 & 27 for **blast cleaning of steel structures** to near white metal surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron and providing and applying two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT including the cost of all labour, material, equipments, protection of surface and cleaning, scoffolding, touch-up painting etc., complete as per drawings, specifications and instructions of the Engineer. Zinc dust composition and properties shall be Type-II as perASTM D520-00. Primer coat shall be applied in Shop immediately after blast cleaning by airless spray technique.	MT	1053			0.5738352776%
D23	Extra over ST NO. A23, B23, A24 & 27 for providing and applying (**by airless spray technique) intermediate coat** of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT after an interval of minimum 24 hours (from the application of primer coat) and of approved make including the cost of all labour, material, equipments, protection and cleaning, scoffolding, touch-up painting etc. all complete as per drawing and specifications.	MT	1053			0.5495268982%
E23	Extra over ST NO.A23, B23, A24 & 27 for providing and applying **Finish coat of two-pack aliphatic Isocyanate cured acrylic finish pain**t (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT over steel sections already having intermediate coats, including the cost of all labour, material, equipments, protection and cleaning, scoffolding etc. all complete as per drawing and specifications. This coat shall be applied after an interval of minimum 24 hours (from the application of sealer coat) and within six (6) months (from the completion of Intermediate coat). Colour and shade of the coat shall be as approved by the Employer.	MT	1053			0.4532249818%
A24	Supplying, fabrication, erection and alignment of **factory made chequered plate** conforming to IS 3502 (minimum 6 mm o/p) in platforms, staircases with edge binding strips and anti-skid nosing in treads etc. including fixing clamps, fittings, fixtures, grinding, drilling, welding, edge preparation, connection design, preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL etc. all complete as per drawing and specification. **(Chequered plate supply is in Contractor's Scope)**	MT	169			2.8565871520%
25	Providing and fixing in positing 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, up to and inclusive of 39 mm diameter and upto 1200 mm long for structural steel work including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, testing, etc. complete as per drawings and specifications.	Quintal	162			0.4736442821%
A25	Providing and fixing in positing of high strength structural bolts **(of property class 10.9 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, up to and inclusive of 39 mm diameter and upto 1200 mm long for structural steel work including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, testing, etc. complete as per drawings and specifications.	Quintal	32			0.1029153008%

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

BOQ CUM RATE SCHEDULE (% WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS W.R.T. THE TOTAL VALUE)

TENDER NO.: BHEL/CPC/KOD/CHM/25/096

CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, SUPPLY ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND

B25	Providing and fixing in position (for liner supporting hangers) of **precision bolts of property class 8.8** conforming to is:1367 with yield strength not less than 700 mpa. and nuts of property class 8s conforming to is:6623 with hardened and tempered washers as per IS:6649 etc. up to and inclusive of 36 mm diameter and upto 300 mm long for structural steel work including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, testing, etc. complete as per drawings and specifications. (The material specifications for nuts and bolts shall be 40 cr4mo3 conforming to is:4367. bolts shall be fixed in close tolerance holes with an overall diameter equal to the nominal bolt diameter +0.15mm. - 0.00mm.)	Quintal	18			0.0526271425%
A26	Providing, fabricating and erecting at all levels, **flues** complete with all bends, flanges, stiffeners, all other internal and external flue attachments, support system, staying system, collars, minishell, cap, access manholes and gas sampling ports alongwith gaskets, cover plates, pipes, bends, fittings,condensate collection and withdrawal arrangement in line with gas-flow-model study report and any other appurtenances like seal pot etc. as required including material, equipment, transporting, lifting to all heights, setting in place, cutting, grinding, rolling, edge preparation, drilling, bending, electrodes and other consumables, alignment, erection bolts and bolting, welding, preheating and post-heating for welding, inspection, required testing, rectification and correction of defective works etc. and other required accessories, connection design & preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL, all complete as per specifications and drawings.					
i)	Components made of structural steel of grade E250 conforming to IS:2062 **[Structural steel of grade E250 conforming to IS:2062 will be provided by BHEL free of cost]**	MT	1310			9.9327807598%
vi)	Components made of titanium (Grade 2 as per ASME B265). **(All material in Contractor's Scope)**	MT	8			3.5593514690%
vii)	Components made of C276. **(All material in Contractor's Scope)**	KG	6600			4.7070737516%
ix)	Components made of SS of grade A316L. **(All material in Contractor's Scope)**	KG	150			0.0122547404%
x)	Components made of acid resistant FRP **(All material in Contractor's Scope)**	KG	5400			0.9218419610%
C26	Providing and applying including blast cleaning of outer surface of steel flue including stiffener to near white metal surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron and providing and applying two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT including the cost of all labour, material, equipments, protection of surface and cleaning, scoffolding, touch-up painting etc., complete as per drawings, specifications and instructions of the Engineer. Zinc dust composition and properties shall be Type-II as perASTM D520-00. Primer coat shall be applied immediately after blast cleaning by airless spray technique. **(Measurement for surface preparation/painting shall be done for outer surface area (based on outer diameter) of Chimney flue can in square meters.)**	Sqm	14890			0.9149718860%
D26	Providing and applying **(by airless spray technique)** on outer surface of steel flue including stiffener, an intermediate coat of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT after an interval of minimum 24 hours (from the application of primer coat) and of approved make including the cost of all labour, material, equipments, protection and cleaning, scoffolding, touch-up painting etc. all complete as per drawing and specifications. **(Measurement for painting shall be done for outer surface area (based on outer diameter) of Chimney flue can in square meters.)**	Sqm	14890			0.6065018881%
E26	Providing and applying on outer surface of steel flue including stiffener, Finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT over steel sections already having intermediate coats, including the cost of all labour, material, equipments, protection and cleaning, scoffolding etc. all complete as per drawing and specifications. This coat shall be applied after an interval of minimum 24 hours (from the application of sealer coat) and within six (6) months (from the completion of Intermediate coat). Colour and shade of the coat shall be as approved by the Employer. **(Measurement for surface preparation/painting shall be done for outer surface area (based on outer diameter) of Chimney flue can in square meters.)**	Sqm	14890			0.6065018881%
27	Supply, fabrication and installation at various locations and elevations of the chimney system the following miscellaneous mild steel items complete with the cost of all labour, material and equipment, transporting, lifting, setting in place, cutting, grinding, drilling, welding, bolts and bolting, anchor fasteners and anchoring, priming, painting, grouting, connection design, preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL etc. complete as per drawings and specifications:					

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

BOQ CUM RATE SCHEDULE (% WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS W.R.T. THE TOTAL VALUE)

TENDER NO.: BHEL/CPC/KOD/CHM/25/096

CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, SUPPLY ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND

a	Mild steel ladders with cage, hood access hatch, louvers, bird screens, hood drain basin covers and other miscellaneous mild steel items not specifically mentioned.	MT	6			0.1056891281%
b	32/40 mm nominal bore medium class tubular **hand railing** for stair case and internal and external platforms.	MT	32			0.6352142556%
d	Providing minimum **610 gsm Hot dipped galvanisation** on mild steel parts as per specification.	MT	2			0.0135428269%
31	Supply, fabrication and installation at all levels, stainless plates (including stainless steel screws and fasteners) of grade AISI 316Land lead sheets beams and over the mild steel in the platform beam bearing, flue supports bearings, flue restraints brackets/ buffers etc. including the cost of all labour material & equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drilling, welding of stainless steel using compatible & approved stainless steel electrodes, testing & machining flat and polishing the contact surfaces of stainless steel, coating the polished surfaces with silicone grease, etc., complete as per drawings and specifications.					
a	Stainless steel components.	KG	300			0.0273138688%
b	Lead Sheets.	KG	100			0.0047343611%
34	Providing, laying and packing, at all levels, asbestos ropes at expansion joints including the cost of all labour material, etc. complete as per drawing and specifications.					
a	**25 mm (diameter)** at expansion joints between linig segments.	Rm	100			0.0086184434%
b	**12 mm (diameter)** at expansion joints between linig segments.	Rm	400			0.0143244222%
35	Providing and installing, at all levels, **resin bonded rock wool insulation** slabs of density not less than 100 kg/cu.m with an installed thickness of not less than 100 mm, on the outside surface of clad steel/titanium flue liners and wherever as directed by the Engineer, in two layers (each 50 mm thick) including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sqm	10			0.0019119659%
36	Providing and packing, at all levels, **loose rock wool insulation** to a density not less than 100 kg/cu.m between the insulated minishells and brick liners at expanjoints between the lining segments and wherever as directed by the Engneer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	Cum	1			0.0016839854%
40	Providing and painting, **with epoxy phenolic coating system in three coats having 220 microns DFT over the external surfaces of chimney shell** and wherever as required at all elevation in alternate bands of 'signal red' and 'bright white' colours including surface preparation, primer etc so as to give a good finish all complete as per drawing and specification. The epoxy phenolic coating system shall be as follows:- All concrete surfaces shall be provided with two component transparent polyamide cured epoxy sealer coating (having solid by volume minimum 40% ±2%) of minimum 50 micron DFT to be applied over cleaned surface in multiple coats. Surface to be coated shall be absolutely dry, clean and dust free. Sealer coat shall be followed with the application of Intermediate coat of epoxy phenolic coating (solid by volume minimum 63%) of minimum 100 micron DFT. This coat shall be applied after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique. Intermediate coat shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT. This coat shall be applied after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the Engineer-in charge.	Sqm	25400			2.7126496109%
41	Providing and painting, **with epoxy phenolic coating system in three coats having 220 microns DFT over the inside surface of chimney shell** above roof/ horizontal surface of shell at top/underside of concrete roof slab and wherever as required at all elevation including surface preparation, primer etc so as to give a good finish all complete as per drawing and specification. The epoxy phenolic coating system shall be as follows:- All concrete surfaces shall be provided with two component transparent polyamide cured epoxy sealer coating (having solid by volume minimum 40% ±2%) of minimum 50 micron DFT to be applied over cleaned surface in multiple coats. Surface to be coated shall be absolutely dry, clean and dust free. Sealer coat shall be followed with the application of Intermediate coat of epoxy phenolic coating (solid by volume minimum 63%) of minimum 100 micron DFT. This coat shall be applied after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique. Intermediate coat shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT. This coat shall be applied after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the Engineer-in charge.	Sqm	700			0.0793255287%
43	Proving and laying over the chimney roof, **a composite acid and heat protection treatment** including providing of slopes for roof drainage including the cost of all labour, material and equipment, etc., complete as required for preparing the roof concrete, laying under bed of plain cement concrete screed to slopes, preparation of screed surface for painting, painting the screed surface with black bituminous paint, applying bitumenmastic in layers, laying acid resisting(A/R) mortar bed and laying 75 mm thick acid resisting(A/R) bricks with A/R mortar, curing, pointing(with phenolic based A/R cement), protection and cleaning, finishing, etc., complete as per drawing and specifications.	Sqm	475			0.2653349582%

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

BOQ CUM RATE SCHEDULE (% WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS W.R.T. THE TOTAL VALUE)

TENDER NO.: BHEL/CPC/KOD/CHM/25/096

CONSTRUCTION OF ONE (1) NO. 275 M TALL TWIN FLUE RCC CHIMNEY COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, SUPPLY ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT, ELEVATORS ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT (BUT EXCLUDING BOROSILICATE WORKS & CHIMNEY RAFT) FOR 2X800MW DVC KODERMA (KTPS) PHASE-II, JHARKHAND

44	Providing, fitting& fixing, outlet and overflow, **cast iron roof drain heads (with gratings) in chimney roof i**ncluding 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 equipement, transporting, lifting, setting in place, painting, etc. complete as per drawing and specifications.	Each	8			0.0133647028%
45	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 nominal bore **cast iron pipes.**	Rm	32			0.0188220793%
b	150 mm nominal bore medium class **galvanised mild steel pipes.**	Rm	550			0.1780766172%
46	Providing and laying **50 mm thick cement concrete flooring** (comprising of 12 mm thick mettallic concrete hardener topping over 38 mm thick under bed of concrete) over the grade level slab inside the chimney, including the cost of all labour, material and equipment, etc. complete as required for preparation of base, laying underbed and topping, finishing, rounding of edges, corners and junctions, curing, testing, etc. complete as per drawing and specifications.	Sqm	990			0.1249167267%
A47	Supplying, fabricating and installing **electrically operated steel roll-up door and grilled ventilation** at chimney base (total opening size of approx. 75 square m in which rolling shutter size will be approx. 4X5 m and remaining area covered with grill for ventilation), with all hardware and mechanisms, fittings and fixtures, locking arrangements, frames, fasteners, gear handle arrangement for standby manual operation, all electrical accessories such as motors, control systems, cables, etc. including connection design, preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL, cost of all labour, material and equipment, fixing in position, grouting primer and finish painting, testing, etc., complete as per drawing and specifications.	Sqm	75			0.0583315414%
48	Supplying, fabricating and installing at any level and location, mild steel, double plate, **personnel access doors,** in shell openings of approx. size 1.2m by 2.1m, complete with all fittings and fixtures, locking arrangements, frames, fasteners including connection design, preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL, cost all labour, material and equipment, lifting to all heights, setting in place, grouting primer and finish painting, etc., complete as per drawing and specifications.	Each	1			0.0045876448%
A49	Supplying, fabricating and installing **SS 316L grade access hatch** for approx opening size of 750mmx750mm in roof slab of chimney complete with locking arrangements, frames, fittings,fixtures and all mechanisms & accessories required for proper operation including connection design, preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL, all labour, painting etc. complete as per drawings and specifications.	Each	1			0.0414807152%
50	**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	1			0.0524657501%
51	Providing & **grouting** of pocket holes, pipe sleeves and under base plates of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with **Conbextra GP-1 or equivalent.** (**Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).**	Cum	1			0.0076115500%
52	Providing & **grouting** of pocket holes, pipe sleeves and under base plate of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with **mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips) using non shrink admixture**. **(Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor).**	Cum	1			0.0038737153%
53	Supplying and erecting after approval by Engineer **a rack and pinion type Elevator** of min 400 kg load carrying capacity, from ground upto top of chimney with landing at various platform level, including all fixtures and accessories complete as per spec. and drawings.	Lumpsum	1			0.9532443327%

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

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54	Designing, providing and **fixing permanently color coated galvanised MS troughed metal sheet decking plate** of approved colour over roof beam for cast-in-situ roof slab as per relevant IS code and Grade as per specification. Bare metal thickness(BMT) of deck plate shall be minimum 0.8mm with minimum trough depth of 44 mm of grade G250 as per AS1397/grade SS255 as per ASTM A653M/ grade S250GD as per EN 10326 with zinc coating to class Z275 and shall serve as permanent shuttering to the floor slab 175 mm thick measured over crest of metal decking & shall have adequate strength to support weight of green concrete and imposed loads of min 100 kg/sqm (for two span condition) during construction between beams as per manufacturer's recommendations/ calculations/ test certificates for approval including connection design & preparation of fabrication drgs and appointment of a seperate agency for review and approval of fabrication drgs in consultation with BHEL, fixing of plates to beams, side lapping, end lapping including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding, laps, hooks, washers, corner pieces etc. at all level as per specification, drawings and as directed by engineer - in - charge all complete. The sheet shall be permanently coated with silicon modified polyster(SMP silicon content 30%-50%) paint or super polyster paint of minimum 20 micron DFT on exposed surface over primer coat of minimum 5 micron(nominal) and minum 10 micron (nominal) SMP or super polyester paint over primer coat of minimum 5 micron (nominal) on other face. SMP and polyster paint system shall be of industrial finish of product type 4 of AS/NZ2728, including fixing of sheet to top flange of beam with drawn arc welding of headed shear anchor studs @ 260mm c/c in the trough and stich screws between two adjacent sheets and sealing with epoxy sealant.The shear anchor studs shall confirm to type B studs specified in AWS D1.1/D1.1M or equivalent as shear connector of 16 mm dia & 75 mm length manufactured from cold drawn round steel bars confirming to ASTM A 29 of grade designation 1010 through 1020 of standard quality with either semi killed or killed welded by drawn arc stud welding through metal deck sheet. Measurement of profile sheeting shall be of the plan area of roof covered by MS trough metal decking. (Supply and fixing of shear connectors shall be paid separately as per BOQ item no-55)	SQM	475			0.1632863621%
55	Providing and fixing shear anchor studs for fixing metal deck sheet to roof structural beams conforming to Type-B studs specified in AWS D1.1/D1.1M or equivalent as shear connector of 16mm diameter and 75mm length manufactured from cold drawn round steel bars conforming to the requirement of ASTM A 29, of grade designation 1010 through 1020, of standard quality with either semi-killed or killed, welded by Drawn Arc Stud Welding through metal deck sheet etc all complete including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding, laps, hooks, washers, corner pieces etc. at all level as per specification, drawings and as directed by engineer - in - charge.	Quintal	3			0.0135544067%
	Electrical Works					
1	415V, 200A, 50 KA for 1 sec, 3-Ph, 4 wire main power AC Distribution Board(MDB) with 1 No. incomer **(TPN MCCB ON BOTH SIDE OF TRANSFORMER)** along with 100KVA lighting transformer (415/415 V, Dyn11, Z=4%, ±2x2.5% Off Ckt. Tap) & 12 nos. of 100A (**TPN MCCB**) outgoing complete in all respects In case load requirement of chimney can not be met by 100 kVA lighting transformer, higher rating transformer shall be provided alongwith suitably rated components without any commercial implications to the purchaser	Nos.	1			0.0846346485%
2	415V, 200A, 3-Ph, 4 wire AC Emergency Lighting distribution board(EDB) along with 50KVA lighting transformer (415/415 V, Dyn11, Z=4%, ±2x2.5% Off Ckt. Tap) with 2 nos. of MCCB incomers **(TPN MCCB ON BOTH SIDE OF TRANSFORMER)** with auto changeover facility using contactor and 8 nos. 100A **MCCB** (TPN) outgoings complete in all respects In case load requirement of chimney can not be met by 50 kVA non encapsulated lighting transformer after considering loading, 100 kVA lighting transformer shall be provided alongwith suitably rated components without any commercial implications to the purchaser.	Nos.	1			0.1435670228%
3	Normal **AC lighting panel outdoor type** with degree of protection IP 55 with one no. 100A **MCB** TPN Incomer, 20 outgoing (20A SP MCBs)	Nos.	4			0.1167509312%
4	**Emergency lighting panel outdoor type** with degree of protection IP 55 with One no. of 100A **MCB** TPN incomer and 12 outgoings (20A, SP MCBs)	Nos.	3			0.0725748420%
5	**Aviation lighting panel outdoor** type with degree of protection IP 55 with one no. 100A **MCB** TPN Incomer, 8 outgoing (20A SP MCBs), photodetector and timer circuit along with 100A contactor to control aviation lighting system.	Nos.	1			0.0311619761%
6	**Aviation Distribution Board (ADB)** with one 32A **MCB** TPN incomer and 8 nos. SP 20A MCB. Construction is same as Lighting Panel.	Nos.	4			0.1221876479%
7	**Aviation obstruction lights:**					
8	a. **High intensity flashing white light** Type-A as per ICAO and NAA/DARA standard with photo-electric controller having an effective intensity of 4000 to 200,000 cd (minimum) depending upon back ground illuminance. Obstacle lights shall have a day time effective intensity of minimum 200000 cd. The intensity of lights shall be 20000 cd ± 25% at twilight and shall reduce automatically to a night time intensity of 4000 cd ± 25% through the use of photocell. It shall be provided with all accessories, photocell, timer etc.	Nos.	16			0.8132554002%
	b. **Temporary obstruction light** of medium intensity 2000 cd and with flashing red light as per ICAO regulation located at diametrically opposite points at the top of chimney during period of construction with four fixture each .	Nos.	4			0.0647734110%
9	**Flood light** with **120W LED** luminaries with all controlgears & accessories	Nos.	8			0.0445962795%
10	A] Well glass type **30W LED** luminaries with all controlgears & accessories	Nos.	70			0.0770302388%
	B] Well glass type **70W LED** luminaries with all controlgears & accessories	Nos.	100			0.2138661316%
	C] Well glass type **50W LED** luminaries with all controlgears & accessories	Nos.	60			0.0994073683%
11	**63 Amp welding switch socke**t with plug & other Mounting accessories	Nos.	10			0.0282694564%
12	3 pin, 1 ph, 240V,20Amp. Power sockets complete with plug Switches etc.	Nos.	10			0.0094224355%
13	Al conductor, XLPE insulated, Armoured, PVC outer sheath, FRLS type 1100V grade conforming to IS-7098 Part I.					
	a) 3½ C x95mm^2 Al for connection between ACDB/ELDB/ welding sockets	Mtrs.	1500			0.2318649084%
	b) 3½ Cx35mm^2 Al for Lighting panel incoming supply	Mtrs.	1500			0.1177605701%

PART-B

Project: 2X800 MW KODERMA TPS PH-II EPC

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	c) 4C x16mm^2 Al for connection between ALP/ADB/Aviation Lights	Mtrs.	1000			0.0658006420%
	d) 4C x 2.5mm^2 Cu Control cable for Aviation lighting system	Mtrs.	700			0.0410639698%
14	PVC insulated 1100V grade stranded Cu Conductor lighting wires conforming to relevant IS. (2.5 mm^2 / 4.0 mm^2)					
	a) 2.5 mm2	meter	10000			0.1262485309%
	b) 4.0 mm2	meter	15000			0.3289990914%
15	a) GI pipe conduit with minimum 25 mm dia with GI junction boxes, GI pull boxes (Size 200x200x100mm of 16 SWG sheet steel for junction & pull boxes) & accessories etc. complete in all respects.	meter	5000			0.1914774877%
	b) PVC coated Flexible steel conduit 25mm dia with accessories	meter	500			0.0054833182%
16	Lightning protection Air terminal : Lead coated copper material of 20 mm dia & 3 metre long.	Nos.	6			0.0163444910%
17	50x6 GS Strip/conductor for coronal band and horizontal air termination as per specification.	Mtrs.	500			0.0135779364%
18	Electrical equipment earthing materials including down conductors 50x6 GS Strip	Mtrs.	2000			0.1879971272%
19	Electrical equipment earthing materials 25x3 GS Strip	Mtrs.	300			0.0157708518%
20	14 SWG GI wire for equipment earthing	Mtrs.	4000			0.0431759102%
21	Test links 150x50x6 for down conductors enclosed in 200mm X 200mm X 100mm GI box of 16SWG sheet steel.	Nos.	6			0.0126524406%
22	**40mm dia MS rod** for Earth mat	Mtrs.	300			0.0495062946%
23	Earthpit with earthing electrode including brick chamber with cover, accessories etc. complete in all respect.	Nos.	6			0.0078061429%
24	GS cable trays. Cable trays shall be of ladder type constructed of minimum 2 mm thick mild steel hot dip galvanise including cover, cabling material, accessories etc. complete as per drawings & specifications.					
	a) 600 mm wide	meter	300			0.0802174071%
	b) 300 mm wide	meter	150			0.0222466700%
	c) 150 mm wide	meter	150			0.0186955902%
25	Telephone socket with junction box etc.	Nos.	10			0.0098333651%
26	Telephone handsets	Nos.	10			0.0023622298%
27	Telephone cable (minimum 4 pair) of minimum 0.6 mm dia annealed high conductivity electro copper conductor, PVC insulated, twisted, PVC tape wrapped, screened, tip corded, PVC sheathed, confirming to relevant ITD (Indian Telephones department) specification					
	a) 24 pairs	meter	400			0.0505511441%
	b) 4 pairs	meter	150			0.0011228178%
28	**Mandatory Spares**					
a)	Power supply card	NOS.	6			0.0604801454%
b)	Electronic flasher card	NOS.	3			0.0264253415%
c)	Photocell control unit	NOS.	3			0.0139567850%
d)	Spare lamp / tube with holder for Aviation Obstruction Lighting Fixture	NOS.	12			0.0893390414%
				TOTAL AMOUNT (Excluding GST)=	**0.0**	100.00000000000%