

Corrigendum 2 dated May 25, 2018 to Tender Specification BHEL PSSR SCT 1725

A) The following clauses are changed / modified as below:

No	Ref. clause	Existing clause	Changed / Modified clause
1)	Techno commercial bid Volume – I Book - I Notice Inviting Tender Clause no 1.0 (vii)	Earnest Money Deposit (EMD) amount Rs.53,00,000/- (Rupees Fifty three lakhs only).	Earnest Money Deposit (EMD) amount Rs.52,00,000/- (Rupees Fifty two lakhs only).
2)	Techno commercial bid Volume – I Book - I Notice Inviting Tender Annexure-III Pre Qualification Criteria Clause B-1	<p align="center">PRE QUALIFICATION CRITERIA – Technical</p> <p>B. Technical PQR</p> <p>Bidder should have executed the following (B.1 and B.2) in the last seven years from the latest date of bid submission.</p> <p>B.1 One (1) chimney work of value not less than Rs.34.40 crores</p> <p align="center">(OR)</p> <p>Two (2) chimney works each of value not less than Rs.21.50 crores</p> <p align="center">(OR)</p> <p>Three (3) chimney works each of value not less than Rs.17.20 crores</p>	<p align="center">PRE QUALIFICATION CRITERIA – Technical</p> <p>C. Technical PQR</p> <p>Bidder should have executed the following (B.1 and B.2) in the last seven years from the latest date of bid submission.</p> <p>B.1 One (1) chimney work of value not less than Rs.33.60 crores</p> <p align="center">(OR)</p> <p>Two (2) chimney works each of value not less than Rs.21.00 crores</p> <p align="center">(OR)</p> <p>Three (3) chimney works each of value not less than Rs.16.80 crores</p>

No	Ref. clause	Existing clause	Changed / Modified clause
3)	Techno commercial bid Volume – I Book - I Notice Inviting Tender Annexure-1 Pre Qualification Criteria Clause C-1	<u>FINANCIAL</u> Turnover: Bidders must have achieved an average annual financial turnover (Audited) of Rs.12,90,00,000/- (Rs.Twelve crores ninety lakhs only) or more over last three Financial Years (FY) i.e 2014-15, 2015-16 and 2016-17.	<u>FINANCIAL</u> Turnover : Bidders must have achieved an average annual financial turnover (Audited) of Rs.12,60,00,000/- (Rs.Twelve crores sixty lakhs only) or more over last three Financial Years (FY) i.e 2014-15, 2015-16 and 2016-17.
4)	Volume- I Book II Special Conditions of Contract Clause no 4.1.11	All charges on account of Octroi, terminal or sales tax and other duties on materials obtained from any source for carrying out the works in the scope of the contractor shall be borne by the contractor.	Clause 4.1.11 stands deleted.
5)	Volume- I Book II Forms and Procedures Form No F-03		No Deviation Certificate (Form -03) was revised and got attached in Part-2, Chapter-6. Bidders are requested to submit the certificate in the revised format. For revised format please refer Volume- I Book- I part II Chapter-6 of the tender specification.

B) Some of the bidders had raised queries in the published tender specification. The Clarifications issued by BHEL are furnished below:

No	Reference clause	Existing provision	Bidder's query	BHEL's clarification
1)	Price bid		Various queries raised by the bidders on the description of items in Price bid.	Please refer the Price bid- Revision-01 attached herewith. Bidders are requested to upload only the revised price bid.

No	Reference clause	Existing provision	Bidder's query	BHEL's clarification
2)	Technical Conditions of Contract (TCC) Volume IA, Part-I Chapter - III Clause 1.3.1.2.2	Electricity for the office, stores, canteen etc. of the bidder.	We request you to provide us the electricity for our site office, stores, canteen etc. free of cost at one single point. Please consider and confirm.	Construction power for Site Office, Stores, Batching Plants, Storage Yard, Workshops shall be provided at free of cost. Construction power for Labour Colony and Staff Colony shall be provided at single point on chargeable basis as per the prevailing rate of TSGENCO.
3)	Technical Conditions of Contract (TCC) Volume IA, Part-I Chapter - III Clause 1.3.3	Land for labour colony shall be provided by BHEL approximately nearer to site	We presume, Land for labour colony shall be provided by BHEL Free of Cost. Please confirm.	Land for Site Office, Stores, Batching Plants, Storage Yard, Workshops shall be provided inside the plant at free of cost. Land for Labour Colony and Staff Colony shall be provided outside the Plant premises at free of cost near the site location.
4)	Technical Conditions of Contract (TCC) Volume IA, Part-I Chapter - III Clause 1.3.1.3 & 1.3.4.1	TCC, Clause 1.3.4.1 Water (Raw water) required for construction purposes will be provided at one single point within the plant area free of cost. 1.3.1.3 of Scope Matrix Water is indicated in Bidder's Scope	We presume, water required for construction purposes shall be provided at one single point within the plant area by BHEL free of cost. Please confirm.	Construction water for Site Office, Stores, Batching Plants, Storage Yard, Workshops shall be provided at single point at free of cost. Construction water for labour Colony and Staff Colony shall be provided at single point on chargeable basis as per the prevailing rate of Telangana Government.

No	Reference clause	Existing provision	Bidder's query	BHEL's clarification
5)	Technical Conditions of Contract (TCC) Volume IA, Part-II Chapter - 1 Clause Sr.No 07	Mobilization Advance: Interest bearing mobilization advance for Mobilization, limited to 5% of the contract value will be paid against submission of BG	We request you to provide us interest free mobilization advance equivalent to 10% of contract value against submission of bank guarantee. Please consider & confirm.	Tender condition prevails

All other conditions of the tender specification remain unchanged.

Bidders are requested to consider this corrigendum as part of tender specification and quote accordingly.

-Sd-
Sr. Manager / Subcontracts
(S.P.Sethuraman)

**TENDER SPECIFICATION
BHEL PSSR SCT 1725**

For

**PACKAGE 1 AND PACKAGE 2 OF CONSTRUCTION OF TWIN
STEEL FLUE CONCRETE CHIMNEY OF 275 METRE HEIGHT
INCLUDING ALL CIVIL, ELECTRICAL AND ELEVATOR WORKS ETC**

AT

**YADADRI THERMAL POWER PROJECT- 5 X 800 MW,
VEERLAPALEM VILLAGE, DAMARACHERLA MANDAL,
NALGONDA DISTRICT TELANGANA STATE**

VOLUME –II

**PRICE BID
REVISION - 01**



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

Power Sector – Southern Region

690, Anna Salai, Nandanam, Chennai – 600 035

BHARAT HEAVY ELECTRICALS LIMITED

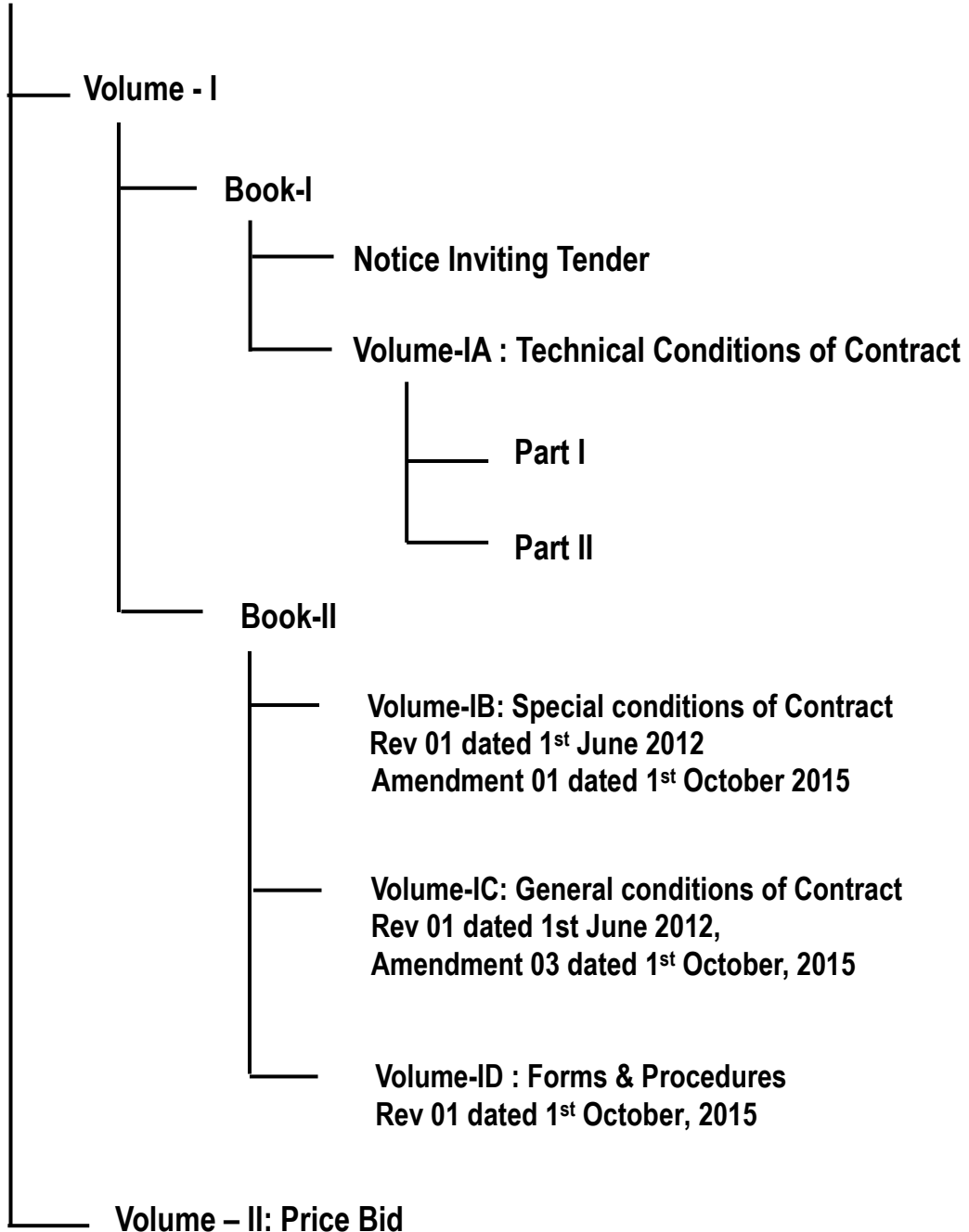
(A Government of India Undertaking)

Power Sector – Southern Region

690, Anna Salai, Nandanam, Chennai – 600 035.

TENDER SPECIFICATION CONSISTS OF

Tender Specification



PRICE BID Revision - 01

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PART A

Instruction to Bidders:

1. The quantity indicated in the BOQ / Price bid part-C is approximate only and is liable for variation. Payment will be as per actual quantity executed as certified by BHEL Engineer.
2. Tenderers are requested to affix their company seal and authorized signature in all pages.
3. Bidders shall only quote 'Total Amount' in the format given in PART -B of the price bid. Any other entry elsewhere in the price bid shall be treated as Null and Void. Quoting of rates in any other form / formats will not be entertained.
4. The above mentioned 'Total amount' is for the entire Bill of Quantity (BOQ) given in Part -C of the Price Bid.
5. BHEL has pre-fixed the weightages for the amount of individual items of Bill of Quantity with respect to the 'Total Amount' in Part-C.
6. Based on the pre-fixed weightages, the amount for the individual items of the Bill of Quantity shall be arrived at. This amount shall be rounded off to the nearest rupee.
7. Based on the quantities of individual item and the amount arrived in SI No: 6 above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
8. Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per SI No.7 above.

Part B: Format to quote Total Amount

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Total Amount for the entire Bill of Quantities(BOQ) given in Part C

In Figures

In words

Note :

Bidders to quote Total Amount in this format given above, which shall be taken into account for evaluation and awarding and hence, shall be complete in all respect for the full scope defined in specification and in accordance with all terms & conditions of tender.

Date

SIGNATURE OF BIDDER WITH SEAL

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
I	Civil Works	--		
1.0	Earth work in excavation in all types of soil including moorum, ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading/levelling of disposed materials etc all complete for following depths below ground level including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge	--		
b	Depth exceeding 2 m but not exceeding 4 m	cum	1,210	.0004265
3.0	Earth work in excavation in soft rock (rock without any recovery of excavated materials in the form of hard stone/boulder) including weathered rock which can be excavated by means of crow bar, pick axe, pneumatic rock breaker attachment with excavator machine etc but does not require chiselling or blasting including setting out, levelling, dewatering (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading / levelling of disposed materials etc all complete for following depths below ground level including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	--		
a	Depth from ground level but not exceeding 2 m	cum	1,781	.0005772
b	Depth exceeding 2 m but not exceeding 4 m	cum	605	.0002353

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at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
5.0	Earth work in excavation in hard rock requiring controlled blasting including wedging, line drilling, pre shearing etc as required, setting out, levelling, dewatering (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statutory clearances for blasting, supply, storage & handling of blasting materials, stacking/disposal of surplus excavated material within a lead upto 500m, spreading / levelling of disposed materials etc all complete for following depths below ground level including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer-in-charge.	--		
a	Depth from ground level but not exceeding 2 m	cum	763	.000565
b	Depth exceeding 2 m but not exceeding 4 m	cum	3,025	.0026907
c	Depth exceeding 4 m but not exceeding 6 m	cum	4,595	.0049025
d	Depth exceeding 6 m but not exceeding 8 m	cum	2,262.5	.0028956
6.0	Earth work in excavation in hard rock requiring chiselling including wedging, line drilling, pre shearing etc as required, setting out, levelling, deawtering (wherever required), dressing the sides & bottom, all lifts, stacking/disposal of surplus excavated material within a lead upto 500m, spreading / levelling of disposed materials etc all complete for following depths below ground level including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	--		
d	Depth exceeding 6 m but not exceeding 8 m	cum	252	.0012561

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
7.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials from compulsorily excavated soil available within a lead upto 500m and compacted as specified including re-excavation of stacked material, watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer-in-charge.	--		
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	1,102.5	.0002139
8.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials directly from excavation and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer-in-charge.	--		
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	1,655	.0000979
9.0	Extra over item No. 1 and 3 to 7 for carriage of excavated earth/selected materials for every 1 km or part thereof beyond an initial lead of 500m.	cum	11,735	.0002776
10.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with approved borrowed earth (borrowed earth to be arranged by the bidder) and compacted as specified including supplying borrowed earth, royalty (if any), watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	--		
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	918.5	.0009735

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
11.0	Supplying and filling sand upto any depth below grade slab, around foundations, etc. in layers not exceeding 250 mm 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) etc. all complete including necessary labour, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	cum	510	.001478
12.0	Supplying and laying (inside chimney in the space below the grade level slab) crushed rock (63mm down graded) 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.	cum	1,110	.0041066
13.0	Providing and laying Nominal Mix plain cement concrete (1:3:6) 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 shall be supplied by BHEL at free of cost)	cum	309	.003114
14.0	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 shall be supplied by BHEL at free of cost for all concrete items mentioned below)	--		
i	For all works below ground level (except chimney shell)	--		
a	Grade M-25 (foundations, etc)	cum	11,147	.1413942

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
Ia	Extra over St. No. 14(i) for controlling of temperature of fresh concrete for raft/pilecap to less than 23 degree centigrade using ice, including all related arrangements for providing, storing and mixing of ice with water, cooling of aggregates etc. All complete as per specification, drawing and instruction of engineer in charge.	cum	8,370	.0152466
ii	For all other works	--		
a	Grade M-20 (grade level slab)	cum	160	.0017411
c	Grade M-40 for chimney shell, corbels and external platforms and other shell attachments.	cum	15,910	.2069639
d	Grade M-25 for all other components of the super structure, roof slab, mini -shells, beams, columns wall etc.	cum	45	.0005688
Ad	Rebate over item no. 14 (ii)c for providing Grade M-35 concrete instead of Grade M-40 concrete	cum	15,910	-.000542
15.0	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.	Sqm	1,800	.0004667
16.0	Collection from BHEL Stores, Transportation 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, equipment, handling, transporting, testing, etc. preparation of bar bending schedules, all complete as per specifications, drawings and instructions of the Engineer. TMT steel of grade Fe-500 conforming to IS:1786 (Fe-500D reinforcement steel will be supplied by BHEL at free of cost (excluding mild steel reinforcement)).	--		
i	For all works below ground level (except chimney shell)	--		
a	High strength deformed bars (supply by BHEL)	MT	1,280	.0318523
ii	For all other works	--		

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Mild steel reinforcement bars (supply under bidders scope)	MT	45	.0063161
b	High strength deformed bars (supply by BHEL)	MT	1,750	.0435481
17.0	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 all works below ground level (except chimney shell)	Sqm	2,677	.0028815
ii	For all other works	--		
a	Inner and outer faces of wind shield with slip form shuttering	Sqm	39,555	.0632564
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	1,300	.0030877
18.0	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.	Sqm	120	.000247
19.0	Providing and placing in position at all levels, building paper (Kraft paper), as per IS:1397, between concrete surfaces including the cost of labour, material, etc. complete as per drawings and instruction of the Engineer.	Sqm	79	.0000437
20.0	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	44	.0000426

Part C : Bill of Quantities**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
21.0	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, application of primer, cost of all labour, material and equipments etc., complete as per drawings, specifications and instructions of the Engineer.	Kg	650	.0001815
22.0	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	5	.001254
23.0	Preparing detailed fabrication drawings after approval by the Engineer, transportation, fabricating and erecting structural steel work for the stair case (from grade level to roof level), internal platforms, walkway gallery structures, chequered plate panels (for floors of internal and external platforms), treads and landings of the staircase including brackets, kick plates, structural members, beam support bearings on the shell, stiffeners, seats, blockouts, ready to bolt fixtures, cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, welding to cast in fixing place, cutting, grinding, drilling, bolts and bolting, anchor fasteners, welding, preheating and post heating for welding, testing, surface preparation, primer and finish painting etc. complete as per drawing and specifications. (surface preparation, primer and finish painting is payable separately)(Raw Steel shall be supplied by BHEL at free of cost)	MT	660	.0730681
A23	Blast cleaning of steel structures to near white metal surface(Sa 2 1/2) and applying epoxy resin based zinc rich primer as per IS:14589 in 2 coats including touch-up painting etc all complete.	MT	660	.0059456
B23	Providing and applying two coats of synthetic enamel paint with minimum 50 micron total dry film thickness (DFT) of approved make and shade to achieve an even shade over steel sections already having primer coats and keeping overall DFT with primer not less than 110 microns including protection and cleaning, scaffolding etc. all complete.	MT	660	.0031805

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
24.0	Supplying, fabrication, erection and alignment of factory made electroforged galvanised grating units with mild steel having minimum galvanisation conforming to IS:2062 in flooring, platforms, drain and trench covers, walk-ways, passages, staircases with edge binding strips and anti-skid nosing in treads etc. including fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete. Minimum galvanisation of 610 g/sqm.	MT	15	.0026939
25.0	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 etc. up to and inclusive of 39 mm diameter and upto 300 mm long for structural steel work etc all complete.	Quintal	68	.0023782
A26	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and erecting, at all levels, MS flues (liners) complete with all bends, flanges, stiffeners, all other flue attachments, support system, collars, access manholes and gas sampling ports alongwith gaskets and other accessories, staying system, including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, bending, bolts and bolting, welding, preheating and post-heating for welding, testing, etc. complete as per drawings and specifications.(structural steel shall be supplied by BHEL free of cost)	MT	1,120	.1133586
B26	Extra over ST NO. A26 for blast cleaning of MS flue liners (both inner & outer surfaces) to near white metal surface (Sa 2 1/2) and applying one coat of inorganic zinc silicate coating primer @ 65-75 microns DFT per coat complete as per drawings and specifications.	MT	1,120	.0100895
C26	Providing and painting finish coat, at all levels, inside surface of MS flues (liners) and other components/surfaces of liners as indicated in the drawings and wherever as directed by the Engineer with 2 coats of heat resistant silicone aluminum paint (single pack silicone resin based medium with aluminum flakes and ambient temperature curing type) @ 20 microns DFT/coat to give a paint DFT of not less than 40 microns including the cost of all labour, materials, equipment, protecting etc. complete as per drawings and specifications.	Sqm	10,260	.0979857

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
27.0	Providing, fabricating and installing 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, primer, painting, grouting etc. complete as per drawings and specifications:(All materials to be supplied by the contractor)	--		
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	15	.0033186
b	Extra over Item no 27(a) above :Providing minimum 275 gsm Hot dipped galvanisation on mild steel parts as per specification.	MT	15	.0012008
A27	Supply, fabrication and fixing of GI pipe hand railing of 32 NB (Medium duty) including transportation, loading/unloading, painting etc. all complete..	MT	22	.004728
A28	Preparing detailed fabrication drawings after approval by the Engineer, providing, fabricating and erecting, at all levels, galvanised mild steel strakes complete with all stiffeners, attachments, fasteners, pipe sleeves, etc. including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, embedding components in concrete, fixing to cast-in embedments, cutting, grinding, drilling, bolts and bolting, welding, preheating and post heating for welding , testing, grouting, primer and finish painting of exposed components, etc. complete as per drawing and specifications.(All materials to be supplied by the contractor)	MT	68	.0147559
29.0	Supplying, fabricating and installing in the liners, gas sampling and gas oapacity measurement ports made from SS grade 316L pipe 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	10	.0003558
30.0	Preparing detailed fabrication drawings after approval by the Engineer, providing, fabricating and erecting, at all levels SS Mini Shell at roof shell of grade A316L , etc. complete as per drawing and specifications.	MT	8	.0084421

Part C : Bill of Quantities

**Tender Specification BHEL:PSSR:SCT:1725 Rev1 for Chimney
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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
31.0	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing at all levels, stainless plates (including stainless steel screws and fasteners) of grade AISI 316L and 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.	MT	0.22	.0002942
b	Lead Sheets.	Kg	72	.0001482
32.0	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing expansion compensator joints including bolster in the flue liner including all labour, material and equipment transporting, hoisting, fixing in position, drilling, cutting, bolts and bolting, etc. along with the user handbooks (giving details of installation, dismantling and maintenance procedures for the expansion joints), testing, etc complete as per drawings and specifications.	Sqm	150	.0068149
33.0	Supplying ,Fabricated Ready to Install, spare expansion compensators alongwith bolster including the cost of all labour, material and equipment, accessories, transporting, proper packaging (for several years of storage), and delivery to site store complete in all respects as per drawings and specification.	Sqm	40	.0018173
34.0	Supplying and laying in position shaped acid resisting bricks conforming to class - I of IS:4860 at all elevations for liner, baffle wall construction (with sloped A/R mortar toppings over brick work) complete including the cost,of all labour, material and equipment, raking joints, flush pointing, cleaning, curing, etc. complete as per drawings and specifications.	Cum	29	.0034007
37.0	Supplying, and placing in position (at the beam supports bearings) Neoprene 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.	Cum	1	.0013385

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at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
40.0	Supplying, fabricating & installing, at all levels mild steel circumferential reinforcing bands around the brick liners at all elevations including the cost of all labour, transportation, materials & equipments, lifting to all heights, setting in place, a/r mortar fill behind bands, cutting, bending, drilling, grinding, bolts and bolting, priming, finish painting, etc. complete as per drawings and specification.	MT	2	.0003158
41.0	Providing, fabricating and installing, at all levels, chemical lead sheet (2 mm thick) at expansion joints between brick lining segments including the cost of all labour, transportation, material & equipments, cutting, soldering of joints, testing etc. complete as per drawings and specifications.	Kg	45	.00003
42.0	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	5	.0004275
a	25 mm (diameter) at expansion joints between brick lining segments.	Rm	172	.0001339
b	12 mm (diameter) at expansion joints between brick lining segments.	Rm	1,032	.0003855
44.0	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.	Sqm	12	.0000559
b	3 mm thick asbestos mill boards.	Sqm	1	.0000008
45.0	Supplying, fabricating and installing, on top of the mini shells, grey cast iron caps complete including the cost of all labour, material and equipment, transporting, test assembling, drilling, lifting to position, setting in place, bolts and bolting, inclusive of bronze rag bolts bronze bolts and nuts, brass washers, non-shrink grout, primer and finish painting, etc., complete as per drawings and specifications.	MT	2.7	.0007505

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
46.0	Providing and installing, at all levels, resin bonded glass wool insulation slabs of density not less than 64 kg/m ³ with an installed thickness of not less than 100 mm, on the outside surface of steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps 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	5,160	.0183592
47.0	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 steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps 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	5,160	.010303
48.0	Providing and packing, at all levels, loose glass wool insulation to a density not less than 64 kg/m ³ between the insulated minishells and brick liners at expansion joints between the lining segments and wherever as directed by the Engineer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	Cum	5	.0001159
49.0	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 expansion joints between the lining segments and wherever as directed by the Engineer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	Cum	5	.0001313

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
50.0	Providing and painting, at all levels, inside surface of chimney shell, inside and outside surfaces of minishells, underside of roof slab and other concrete components/surfaces of the chimney as indicated in the drawings and wherever as directed by the Engineer, with acid and heat resisting black bituminous paint (conforming to type I(i) of IS:158) in as many number of coats (not less than four coats in any case) as required to give a paint DFT of not less than 150 microns including the cost of all labour, materials, equipment, surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specifications.	Sqm	20,070	.0120593
53.0	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with synthetic enamel paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material & equipment, surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification. Total DFT of 150 micron shall be achieved in minimum 2 coats of synthetic enamel paint including 2 coats of primer confirming to IS 2932 and IS 2933.	Sqm	17,640	.0104944
54.0	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with acid and heat resistant polyurethane paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material & equipment, surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification.	Sqm	3,475	.0034749
55.0	Providing 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 bitumen mastic 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	275	.0018455

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
56.0	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	.00017
57.0	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 seaant, 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	30	.0002235
b	150 mm nominal bore medium class galvanised mild steel pipes.	Rm	490	.0020611
58.0	Providing and laying 50 mm thick cement concrete flooring (comprising of 12 mm thick mettalic 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. (Cement shall be supplied by BHEL Free of cost)	Sqm	1,020	.0007067
59.0	Providing and installing an electrically operated semi-grill type steel roll-up door (with the bottom approx. 2/3rd of the curtain in solid type) at chimney base, in opening of size approx. 8.1 m by 7.9 m (maximum variation in size +/-3%), 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 the cost of all labour, material and equipment, fixing in position, grouting primer and finish painting, testing, etc., complete as per drawing and specifications.	Each	1	.0005541

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
60.0	Providing and installing at any level and location, mild steel, double plate, personnel access doors, in shell openings of size 1.1m by 2.15m, complete with all fittings and fixtures, locking arrangements, frames, fasteners including the 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	8	.0004669
63.0	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	.0000401
65.0	Designing, supplying, fabricating and installing after approval by the Engineer, non-metallic expansion joints to seal gaps between chimney components and to meet the service requirements as given in the specifications alongwith the cost of all components of the expansion joint, insulation, galvanised bolts, nuts, washers, anchor fasteners and retaining bars, packing materials and reinforcements at the connecting ends and flanges, lapping etc. including preparation of brick surface (to be connected to the expansion joint) with potassium silicate resisting mortar for proper leak tight bearing surface, with the cost of all labour and equipment, user hand books (giving details of installation, dismantling and maintenance procedures for the expansion joints) etc. complete as per drawings and specifications for:	--		
66.0	Supplying and erecting after approval by Engineer an Elevator from ground upto top of chimney with landing at various platform level complete as per spec. and drawings.	Lumpsum	1	.0114374
67.0	Lettering with approved colour synthetic enamel paint including preparation of surface and painting work of base area for lettering on external face of RCC windshield of Chimney. Item includes for all tools & plants, staging, supporting, hanging platforms, safety arrangements, labours, materials etc. to complete the work in all respect.	--		
a	Lettering	Each	1	.000119
b	Logo	Each	1	.0000161

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at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
--	ELECTRICAL WORKS (Supply, installation and testing / commissioning of following items as per specification)	--		
E1	415V, 200A, 50 KA for 0.25 sec, 4 wire AC Lighting distribution board alongwith 50KVA lighting transformer (415/433 V, Dyn11, Z=4%, $\hat{A}\pm 2 \times 2.5\%$ off ckt. Tap) Distribution Board with 1No. incomer (MCCB) & 9 nos. of 100A MCCB (TPN) outgoing complete in all respects	No.	1	.0003739
E2	415V, 200A, 4 wire AC Emergency Lighting distribution board alongwith 50KVA lighting transformer (415/433 V, Dyn11, Z=4%, $\hat{A}\pm 2 \times 2.5\%$ off ckt. Tap) with 2 nos. of MCCB (TPN) incomers with auto changeover facility using contactors and 6 nos. 100A SFU (TPN) outgoing complete in all respects. In case load requirement of chimney can not be met by 50 kVA lighting transformer after considering loading of 80 to 85%, 100 kVA lighting transformer shall be provided alongwith suitably rated components without any commercial implications to the purchaser.	No.	1	.0010375
E3	Normal AC lighting panel outdoor type with degree of protection IP 55 with one no. 100A MCCB (TPN) Incomer , 18 outgoing (16A SP MCBs)	No.	3	.0006282
E4	Emergency lighting panel outdoor type with degree of protection IP 55 with One no. of 100A TPN/MCCB incomer and 12 outgoing (16A, SP MCBs)	No.	6	.0012565
E5	Aviation lighting panel outdoor type with degree of protection IP 55 with one no. 100A MCCB (TPN) Incomer , 8 outgoing (20A SP MCBs)	No.	1	.0002247
E6	Aviation obstruction lights :	--		
a)	a) High intensity flashing white XENON Type-A light having intensity 2000-200000 candles & flashing frequency 40-60/min (as per ICAO), shall be of type FTB 205 and FTC 110N of Flash Technology Corporation of USA or equivalent; including all accessories, controller, flasher etc. complete in all respects.	No.	6	.003469
b)	b) Medium intensity Type B flashing RED light having flashing frequency 20-60/min & intensity as per ICAO .including all accessories, controller, flasher etc. complete in all respects.	No.	3	.0006282
c)	c) Temporary obstruction light located at diametrically opposite points at the top of chimney during period of construction	No.	2	.0003202

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E7	A) Flood light with 250W HPSV lamps with all controlgears & accessories	No.	8	.0001921
B)	(B) Well glass type luminaries with 150W/HPSV lamp with all controlgears & accessories	No.	177	.0021648
E8	63Amp welding switch socket with plug & other Mounting accessories	No.	18	.000567
E9	3 pin, 1 ph, 240V,15Amp. Power sockets complete with plug Switches etc.	No.	20	.0002688
E10	AL conductor, XLPE insulated, Armoured, ST-2 outer sheath, FRLS type 1100V grade conforming to IS-7098 Part I.	--		
a)	a. 3½ C x95mm ² Al for connection between ACDB/ELDB/ welding sockets	RM	1,400	.0026748
b)	b. 3½ Cx35mm ² Al for Lighting panel incoming supply	RM	1,000	.0008854
c)	c. 4C x16mm ² Al Conductor, XLPE insulated, Armoured, PVC outer sheath, FRLS type 1100V grade conforming to IS-7098 Part I for connection between ALP/ADB/Aviation Lights	RM	1,600	.0009052
E11	Control cable shall have annealed tinned copper conductor, 1100grade, PVC insulation, extruded PVC inner sheath ,GS Wire Armoured, , Overall extruded PVC outer sheath, FRLS type .	--		
a)	a. 2.5 mm ²	RM	500	.0000596
E12	PVC insulated 650/1100V grade stranded Cu Conductor lighting wires conforming to IS-694 for the following.	--		
a)	a. 1CX6 mm ² Al from lighting panel to junction boxes	RM	2,000	.000467
b)	b. 1CX2.5 mm ² Al from junction boxes to lighting fixtures(no. of wires per lead as required)	RM	1,500	.0003169
c)	c. 1CX6 mm ² Al from lighting panel to Receptacles	RM	2,000	.0005559
E13	Supply and Fixing of Ground Conductors : The ground conductor sizes for grounding of electrical equipment, lighting fixtures, junction boxes etc. shall be as follows :	--		

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a)	50 mm x 6 mm GI Flat for earthing of Distribution Boards, Lighting Panels and motors above 90 KW	RM	300	.0003869
b)	35 mm x 6 mm GI Flat for Motors above 30 KW upto 90 KW	RM	100	.0000978
c)	25 mm x 3 mm GI Flat for Motors above 5 KW upto 30 KW	RM	100	.0000511
d)	8 SWG GI wire for Motors upto 5 KW	RM	100	.0000089
e)	16 SWG GI wire conduits etc for Lighting Fixtures, junction boxes etc.,	RM	2,000	.0001334
E14	Galvanised steel conduit 32mm dia with junction boxes, pull boxes & accessories etc complete in all respects.	RM	2,000	.0015121
E15	Lightning protection Air terminal Lead coated copper material of 20 mm dia rod & 3 metre long.	No.	6	.0001503
E16	75 x 10 mm galvanised steel flat for down conductors and circumferential band .	RM	1,600	.0041273
E17	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)	a. 600 mm wide	RM	150	.0005837
b)	b. 450 mm wide	RM	100	.0002557
c)	c. 300 mm wide	RM	150	.0003169
d)	d. 150 mm wide	RM	350	.0006226
E18	Aviation Distribution Board (ADB) with one 32A MCCB (TPN) incomer and 8 nos. SP 20A MCB. Construction is same as Lighting Panel.	No.	4	.0020458
E19	Test links for 150x75x10 down conductors enclosed in 150mm X 150mm X 150mm GS box	No.	6	.0000481

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Ref.No.	Description	Unit	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E20	Earthpit with earthing electrode including brick chamber with cover, accessories etc. complete in all respect.	No.	6	.0000993
E21	40mm dia MS rod for earthing of down conductor	RM	100	.0002101
TOTAL Weightage				1.0