

**TENDER SPECIFICATION
BHEL: PSSR: SCT: 1841**

FOR

**Civil Works of TG, Fan foundations, CW
encasing & other miscellaneous
foundations of Units 1, 2, 3, 4 & 5**

AT

**5 X 800 MW Yadadri Thermal Power
Station, Veerlapalem village,
Dameracherla Mandal, NALGONDA
DISTRICT, TELANGANA STATE**

VOLUME-II

PRICE BID



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

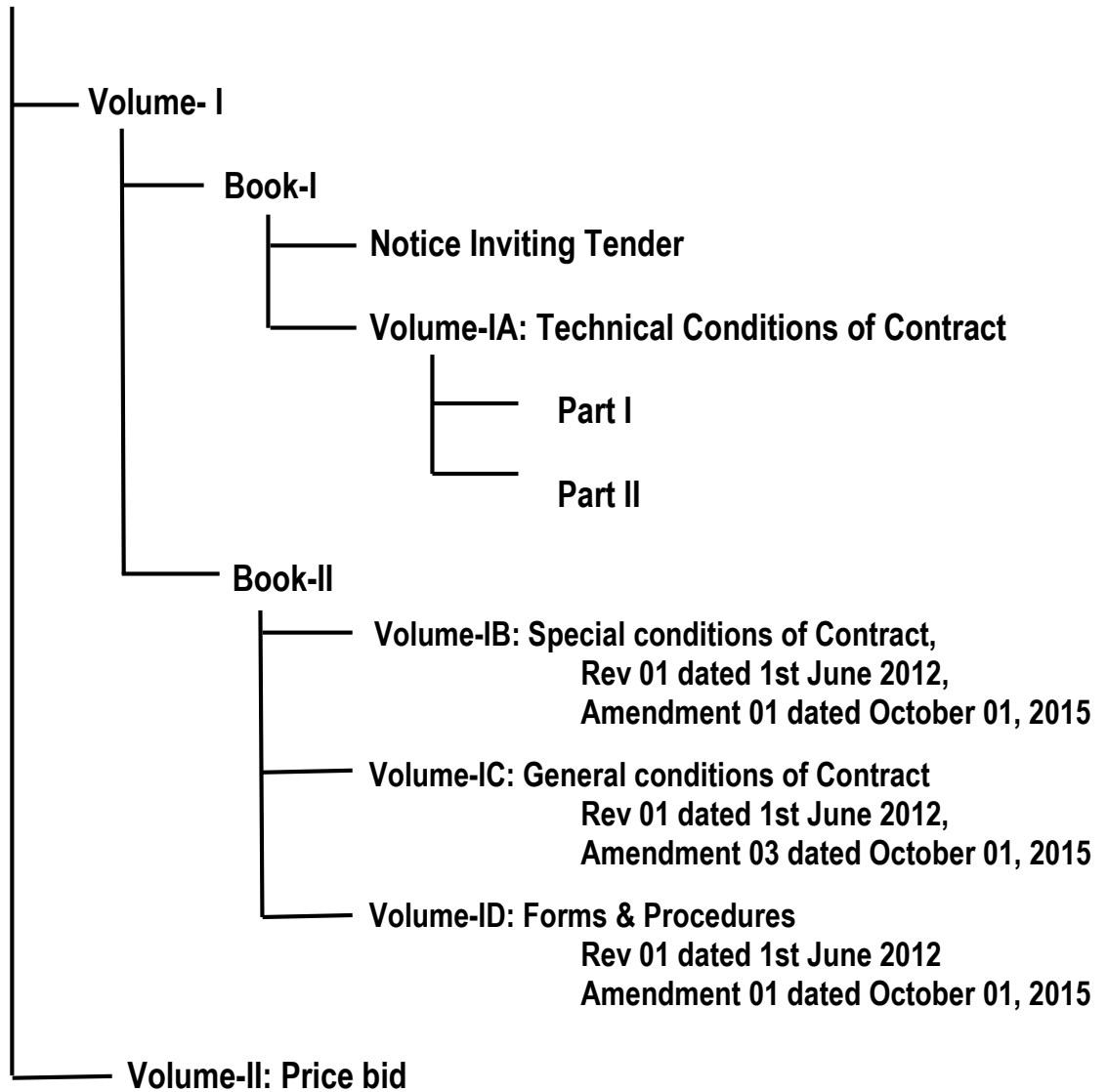
Power Sector – Southern Region

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

PRICE BID

TENDER SPECIFICATION CONSISTS OF

Techno-Commercial Bid



PRICE BID

CONTENTS	
Description	No. of pages
Part A: Instructions to the Bidders	1
Part B: Format to quote total amount	1
Part C: Bill of quantities with weightage for amount of each items w.r.t. the total quoted price	25

PRICE BID

PART-A-INSTRUCTIONS TO BIDDERS:

1. 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.
2. The above mentioned 'Total amount' is for the entire Bill of Quantity (BOQ) given in Part -C of the Price Bid.
3. 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.
4. 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.
5. Based on the quantities of individual item and the amount arrived in SI No: 4 above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
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 SI No.5 above.

Part B: Format to quote Total Amount

**Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works
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:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
100.0	EARTH WORK: Earth work In excavation, backfilling and disposal including all labour, equipments etc complete as per specification, drawing and as directed by engineer- in-charge for the following.	--		
101.0	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), shoring & strutting (wherever required), sheet piling (for excavation below 6m from FGL, if required), 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.	--		
a	Depth from ground level but not exceeding 2 m	CUM	19,559	.0034229
b	Depth exceeding 2 m but not exceeding 4 m	CUM	1,772	.0003876
103.0	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), sheet piling (for excavation below 6m from FGL, if required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1 Km, spreading / levelling of disposed materials etc all complete for following depths below ground level.	--		
a	Depth from ground level but not exceeding 2 m	CUM	17,781	.0036204
b	Depth exceeding 2 m but not exceeding 4 m	CUM	1,611	.0003936

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
104.0	Earth work in excavation below ground level in hard rock requiring blasting (but excluding controlled blasting) including wedging, line drilling, pre shearing etc as required for grading, setting out, levelling, dewatering (wherever required), sheet piling (for excavation below 6m from FGL, if 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 1 Km, spreading / levelling of disposed materials etc all complete as per specification, drawing and as directed by the engineer-in-charge.	--		
a	Depth from ground level but not exceeding 2 m	CUM	22,226	.0087517
b	Depth exceeding 2 m but not exceeding 4 m	CUM	16,911	.0079963
c	Depth exceeding 4 m but not exceeding 6 m	CUM	268	.000152
d	Depth exceeding 6 m but not exceeding 8 m	CUM	268	.0001822
e	Depth exceeding 8 m but not exceeding 10 m	CUM	134	.0001049
105.0	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), sheet piling (for excavation below 6m from FGL, if 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 1Km, spreading / levelling of disposed materials etc all complete for following depths below ground level.	--		
a	Depth from ground level but not exceeding 2 m	CUM	24,893	.0096762
b	Depth exceeding 2 m but not exceeding 4 m	CUM	24,964	.0157949
c	Depth exceeding 4 m but not exceeding 6 m	CUM	8,117	.0045347

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
d	Depth exceeding 6 m but not exceeding 8 m	CUM	193	.0001293
e	Depth exceeding 8 m but not exceeding 10 m	CUM	27	.0000208
106.0	Earth work in excavation in hard rock requiring chiselling including wedging, line drilling, pre shearing etc as required for grading, setting out, levelling, dewatering (wherever required), sheet piling (for excavation below 6m from FGL, if required), dressing the sides & bottom, all lifts, stacking/disposal of surplus excavated material within a lead upto 1Km, spreading / levelling of disposed materials etc all complete for following depths below ground level.	--		
a	Depth from ground level but not exceeding 2 m	CUM	1,778	.0045417
b	Depth exceeding 2 m but not exceeding 4 m	CUM	4,832	.0148146
c	Depth exceeding 4 m but not exceeding 6 m	CUM	2,706	.0099539
d	Depth exceeding 6 m but not exceeding 8 m	CUM	483	.0021319
e	Depth exceeding 8 m but not exceeding 10 m	CUM	161	.0008171
107.0	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 250mm 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.	--		
a	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	7,088	.0008468

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
108.0	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 250mm 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:	--		
a	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	1,459	.0000516
109.0	Extra over ST No. 101 and 103 to 108 for carriage of material/earth for every 500m or part thereof beyond an initial lead of 1km.	--		
a	Carriage for stacking/ backfilling of serviceable material/ earth	CUM	34,190	.0004603
b	Carriage for disposal of serviceable/unserviceable material/ earth	CUM	561,308	.0075562
110.0	Earth work in backfilling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness so as to achieve required compaction with approved borrowed soil (borrowed soil to be arranged by the bidder) and compacted as specified including supplying boorowed soil, royalty/seignorage fee (if any), sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, tesing, all lead and lifts etc all complete as per specification, drawing and as directed by the engineer for the following:	--		
A110	Earth work in backfilling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness so as to achieve required compaction with approved borrowed earth (borrowed earth to be arranged by the bidder) and compacted as specified including supplying borrowed earth, royalty/seignorage fee (if any), sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, testing, all lead and lifts etc all complete as per specification, drawing and as directed by the engineer for the following:	--		

Part C : Bill of Quantities

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	3,011	.0020267
B110	Earth work in backfilling upto any depth below ground level around foundations, plinths, trenches, drains etc. to proper grade and level in layers not exceeding 250mm compacted thickness so as to achieve required compaction with approved excavated material from the area within plant boundary and compacted as specified, dewatering if required, sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, testing etc all complete as per specification, drawing and as directed by the engineer for the following. (Item includes for excavation work in soil and soft rock (i.e., excluding hard rock) for making available approved excavated material (required for back filling) from area identified within plant boundary as per direction of engineer - in - charge for all lead and lifts). Compacted backfilled volume shall be measured for payment.	--		
a	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	3,011	.0005725
A111	Supplying and filling sand upto any depth under floors, around foundations, plinths, surrounding pipe and in pipe beds etc. in layers not exceeding 300 mm thickness and compacted so as to achieve at least 75% relative density as per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete.	CUM	30,000	.1143414
B111	Supplying and filling sand upto any depth under floors, around foundations, plinths etc. in layers not exceeding 200 mm thickness and compacted so as to achieve at least 85% relative density as per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete. Sand for filling shall be clean and well graded conforming to IS 383 with grading not inferior than Zone III.	CUM	500	.0019065

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
200.0	CONCRETE WORK: Providing and placing concrete work including cost of labour, materials (unless otherwise specified in BOQ/contract specification) and equipment for handling, transportation, batching, mixing, placing, vibrating and curing (excluding cost of centering, shuttering and reinforcement) with mechanised equipments like batching plant, transit mixer, concrete pump etc. complete as per drawing, specifications and as per direction of engineer in charge for the following: (Cement supply by BHEL free of cost)	--		
201.0	Concrete of grade M7.5 (1 part cement, 4 part sand, 8 parts of 40 mm graded aggregate by volume) as mass filling course, lean concrete, levelling course, mud mat under and around foundations/ floors, at any depth below finished floor level etc.	CUM	1,000	.0056035
A203	Concrete of grade M15 (1 part cement, 2 part sand, 4 parts of 20 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors at any depth below finished floor level etc.	CUM	3,450	.019332
204.0	Concrete of grade M20 (1 part cement, 1.5 part sand, 3 parts of 20 mm graded aggregate by volume) under floors, paving, plinth protection, pipe encasing etc complete.	CUM	50	.0002802
205.0	Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works with coarse sand and graded hard stone aggregate of 20mm nominal size in foundations/substructure, grade slab, paving, drains, under floors etc at all level below finished floor level, any shape, position or thickness etc complete including use of plasticizer/ superplasticizer conforming to IS:9103 (latest) to achieve required slump in concrete all complete as per specification & drawing for the following.	--		
a	M 25 Grade	CUM	28,750	.1722272
Ad	M 20 Grade	CUM	300	.0017906

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
207.0	Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works of grade mentioned below in machine foundations for TG, Gas Turbine, ID/FD/PA fans, BFP, Coal mills at all elevations below/above finished floor level except TG deck and top decks supported over vibration isolation system but including TG foundation columns with addition of suitable plasticizer conforming to IS 9103(latest) to achieve a slump more than 125mm in concrete as per manufacturer's recommendation with 20 mm nominal size graded aggregate in concrete all complete as per specification & drawing.	--		
a	M 30 Grade	CUM	25,500	.161297
b	M 35 Grade	CUM	4,325	.0274664
208.0	Providing and laying Design Mix cement concrete as per IS:456 & IS 10262-2009 of grades mentioned below for reinforced concrete works using graded aggregate in top decks of all machine foundations supported on vibration isolation system (excluding supply and installation of vibration system) and top deck of TG foundation at all levels including addition of suitable plastisizers conforming to IS9103 to achieve a slump more than 125 mm in concrete as per manufacturers recommendation, preperation of scheme for concreting, getting it approved by engineer, labour, materials, equipment, handling, batching, transporting, mixing, pumping, placing, leveling, vibrating, compacting, curing, testing, cleaning and rendering the exposed surface with cement sand mortar to give a smooth and even surface, maintaining and submitting records of concreting, petrographic examination and potential reactivity of aggregate etc. all complete as per specification, drawing and instructions of engineer, including UPV testing as directed by engineer in charge, rectification of the defects in concreting observed by ultra-sonic pulse velocity (UPV) testing by cement/epoxy grout etc, but excluding formwork, staging, reinforcement, embeddments and temperature control of concrete. Payment terms - a) After casting 75% ; b) After receipt of ultrasonic test report - 25%.	--		
b	M35 Grade	CUM	5,750	.0508941

Part C : Bill of Quantities

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A209	Extra over ST. No. 205 to 208 for controlling of temperature of fresh concrete to less than 25 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	35,575	.0470523
210.0	Extra over ST Nos. 205 to 207 for conducting UPV test for concrete at all levels including all equipments, making necessary arrangements, staging, submission of report etc. all complete as directed by engineer in charge and as per specification.	CUM	10,000	.0058054
214.0	Providing and laying Design Mix cement concrete as per IS:456, IS 3370 & IS 10262-2009 for reinforced concrete works using graded aggregate for Concrete in water retaining/conveying structures including addition of suitable plastisizer cum waterproofing cement additives conforming to IS 9103 latest to achieve a slump more than 125 mm in concrete as per manufacturers recommendation and conforming to limits of permeability as per IS 2545 and specification with 20 mm nominal size graded aggregate for following grades. Watertightness is to be ensured including structural grouting if required.	--		
b	M 30	CUM	500	.0037811
215.0	Dismantling concrete work for all types of structures at all levels including stacking of serviceable material to a lead of 500 m and disposal of unserviceable material upto a lead of 2 km, cutting of reinforcement, labour, equipment, safety precautions etc all complete as per drawings, specification and instructions of engineer in charge.	--		
a	Plain cement concrete of all grades	CUM	15	.0001134
b	Reinforced cement concrete of all grades	CUM	15	.0000383
A215	Rebate over ST No. 215b for taking into account the deemed cost of all serviceable material including reinforcement steel which bidder will be getting out of it by taking them outside plant for bidder's purpose instead of stacking to a lead of 500m inside plant.	--		
b	Reinforced cement concrete of all grades	CUM	15	-.0000021

Part C : Bill of Quantities

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
216.0	Chipping of concrete in reinforced concrete work, cutting pockets, making openings at all levels and according to shapes, disposal of waste materials upto a lead of 2 km as directed by engineer including equipment, safety precautions, making good the broken surface etc all complete as per specification, drawing, instructions of engineer in charge but excluding cutting of reinforcement .	CUDM	1,500	.0001388
217.0	Extra over and above ST No 216 for cutting of reinforcement, all sizes and types including labour, equipment, return of cut reinforcement to store etc all complete as per specification, drawings and instructions of engineer in charge. Measurement shall be on the cross sectional area of reinforcement cut.	SQCM	100	.0000007
218.0	Cutting Reinforced concrete with mechanised tools like Core drilling machine etc. for cutting pockets, holes, cores in slab, beam, column or foundation as per direction of engineer in charge.	CUDM	320	.0001018
220.0	Providing & laying Plum cement concrete 1:3:6 with 75% graded metal of maximum size 40 mm and 25% plums of maximum size 150 mm.	CUM	100	.0005561
223.0	Cutting of existing concrete/ RCC slab (total thickness upto 250mm including floor finish & deck sheet if any) inside control room/ pump house or anywhere inside boundary using power tools of (DD2E of HILTI/ BOSCH make or equivalent) with low noise and dust including cutting reinforcements, removing the rubbish within a lead of 1 km, including making good the broken edges/ surface with cement mortar, painting, finishing to match with existing finishing, scaffolding/ supporting at all level, all complete and as directed by Engineer (measurements shall be taken as per cutting surface area).	SQM	20	.0000724
300.0	FORMWORK: Providing, fixing and removing formwork at all elevations for all structures, as per specifications and including all labour, material, scaffoldings and centering etc. complete as per drawing, specifications and as per direction of engineer in charge for the following:	--		

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
301.0	Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface below finished ground floor level for foundations, footings, base of columns, walls, columns, pilasters, beams, mass concrete, trenches etc.including chamfering of edges as per drawing, specification and instruction of engineer in charge..	SQM	12,825	.01133
302.0	Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface above finished ground floor level for columns, beams, suspended floors, roofs, lintels, cantilevers, staircases, landings, balconies, etc. including chamfering of edges as per drawing.for all heights as per specification, drawing and instruction of engineer in charge.	SQM	5,100	.0053637
303.0	Fairface Formwork with good quality water proof ply wood of minimum 18mm thickness and smooth surface for TG superstructure (above base raft level) including preparation of scheme, designing, submission and approval of staging drawing with sufficient props, braces and ties at every tier of height of approx. 4m for all heights complete including chamfering of edges, deshuttering as per drawing,specification, and instruction of engineer in charge..	SQM	9,708	.0573227
304.0	Providing, fixing and removing formwork in block-outs/pockets and openings (below 0.1 sqm plan area) at all elevations including cutting, formation of all shapes and all other operations required for making the required shape and size all complete as per specification, drawing and instruction of engineer in charge.	--		
a	Upto 150 mm depth	EACH	10	.0000035
b	Pockets of depths more than 150mm and upto 300 mm depth	EACH	20	.0000118
c	Pockets of depths more than 300mm and upto 600 mm depth	EACH	200	.0002127
d	Pockets of depths more than 600mm and upto 1000 mm depth	EACH	20	.0000335
e	Pockets of depths more than 1000mm and upto 1500 mm depth	EACH	20	.0000484

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
305.0	Extra over item no. 301 and 302 for curved form work for foundations, footings, beams, walls, trenches, domes, arches etc as per specification.	--		
a	Extra for Curve Shuttering for Item No. 301	SQM	10	.0000018
b	Extra for Curve Shuttering for Item No. 302	SQM	10	.0000021
400.0	REINFORCEMENT WORK: Reinforcement work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling etc at all level as per specification, drawings and as directed by engineer - in - charge.	--		
401.0	Providing, straightening, cutting, bending, placing in position at all level, binding of mild steel reinforcements conforming to grade 1 of IS:432 part 1 in concrete including cost of reinforcement steel, binding wire, labour, scaffolding, transportation to & from stores etc. all complete as per specifications & drawings.	MT	5	.0004311
403.0	Transportation, straightening, cutting, bending, placing in position at all level, binding in position of steel reinforcements of TMT steel of grade Fe-500D or 500EQR confirming to IS:1786 including cost of binding wire, labour, scaffolding, transportation to & from stores etc complete all as per specifications, drawings and as directed by Engineer.(BHEL to supply steel free of cost)	MT	8,283	.1835082
405.0	Providing & fixing of Rebar in existing concrete surface by inserting reinforcement bar with Epoxy based suitable bonding compound of Hilti or equivalent make (HIT-RE-500 of Hilti or equivalent make) for interconnection of new R.C. structure with existing R.C. structure. Depth of drilled hole should be suitable to develop maximum recommended strength as per approved manufacturer's recommendation. This item includes supply of all materials including bonding chemicals, T&P required to execute the work, cost of all labour, transportation of chemical, staging to reach work place etc. all complete as directed by Engineer - in - Charge. Random Pull out non-destructive test as directed by engineer shall be conducted to ensure strength of bond and same is included in this item. Reinforcement bar shall be paid separately under item no. 402, 403, 404 as applicable.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	12mm Reinforcement bar	EACH	20	.0000126
b	16mm Reinforcement bar	EACH	20	.0000197
c	20mm Reinforcement bar	EACH	20	.0000274
A406	Providing and fixing parallel threaded reinforcement couplers for mechanical splices of rebars (TMT/ CRS TMT) for concrete reinforcement including supply of couplers as per IS: 16172 made out of EN8D grade high strength alloy material , threading on rebars to be coupled with coupler, enlargement at connection by forging,protecting the prepared reinforcement bars, fitting & fixing of couplers under specialized supervision, quality tests & checks (for couplers and coupled joints) etc. all complete as per direction of Engineer in charge. The couplers shall match to the properties of rebars of grade equal to Fe 550 D of IS 1786. The cost shall include for all works and tests including mobilisation, demobilisation, loading/unloading of required plant/ machinery at site for threading & forging works, tools & tackles, labour & supervision, consumables and all incidental expenses for satisfactory execution of the work . (No deduction for labour and binding wire saved for not providing lap length shall be made).	--		
a	Coupler of class H for 16 mm diameter reinforcement bar.	EACH	200	.0000256
b	Coupler of class H for 20 mm diameter reinforcement bar.	EACH	500	.0000639
c	Coupler of class H for 25 mm diameter reinforcement bar.	EACH	500	.0000909
d	Coupler of class H for 28 mm diameter reinforcement bar.	EACH	400	.0000875
e	Coupler of class H for 32 mm diameter reinforcement bar.	EACH	400	.0001171

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A407	Welding of lap joints of steel reinforcements of TMT steel of grade Fe-500D or 500EQR confirming to IS:1786 (Latest) including cost of welding electrodes, labour, tools and plants etc. complete as permitted and directed by Engineer. Measurement shall be done for the number of joints welded comprising of weld deposition of 2.5d length each on both side of lap joint (i.e total 5d length of weld deposition). Here, d is the diameter of reinforcement bar.	--		
a	For d=16 mm	Each	250	.0000067
b	For d=20 mm	Each	500	.0000168
c	For d=25 mm	Each	500	.000021
d	For d=28 mm	Each	400	.0000188
e	For d=32 mm	Each	400	.0000215
500.0	Roof Treatment works: Roof treatment works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, curing, sampling, testing etc at all level as per specification, drawings and as directed by engineer - in - charge. Cement shall be supplied by BHEL free of cost.	--		
511.0	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, wall, column etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete.	SQM	12,825	.002525
513.0	Providing and mixing water proofing compound conforming to IS:2645 in concrete or cement mortar all complete.	KG	2,000	.0002457
600.0	JOINTS AND FILLERS: Joints & fillers including all labour, material, equipment, transportation, handling etc at all level as per specification, drawings and as directed by engineer - in - charge.	--		

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
601.0	Supplying & installation of bitumen impregnated fibre board confirming to IS 1838 as joint filler at joints in concrete including nailing, coating of both faces with coal tar pitch/bitumen etc. all complete.	--		
a	12 mm wide joints.	SQM	50	.0000358
b	20 mm wide joints.	SQM	50	.0000549
c	25 mm wide joints	SQM	50	.0000668
d	50 mm wide joints	SQM	50	.0001266
602.0	Supplying and installation of Dura board HD100 or its equivalent as approved by the Engineer, as filler material in joints including nailing, installation as per manufacturer's recommendation etc. all complete.	--		
a	12 mm wide joints.	SQM	50	.0000434
b	20 mm wide joints.	SQM	20	.0000271
c	25 mm wide joints	SQM	20	.0000331
d	50 mm wide joints	SQM	20	.0000634
610.0	Providing and fixing PVC water stops in joints conforming to IS 12200 & IS 15058 all complete for the following: (Bulb or Kicker type)	--		
b	230 mm wide and 8 mm thick	RM	100	.000032
d	230 mm wide and 6 mm thick	RM	100	.0000501
612.0	Providing and applying approved fire retardant sealant in joints/openings including cleaning of joints/openings, raking out groove, application of primer, scaffolding etc. all complete.	--		

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
700.0	MS EMBEDMENTS: Embedments including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling etc. at all level as per specification, drawings and as directed by engineer - in - charge.	--		
701.0	Supply, fabricating and fixing of mild steel embedments, inserts, pipe sleeves, angle pieces, rungs of various diameters, plates of dimensions as required etc. including welding, bolting, cutting, drilling, scaffolding, setting etc. all complete.	MT	50	.0054563
702.0	Supply, Fabrication, transportation, delivery at site and erection, installation and alignment of mild steel foundation bolt assembly conforming to IS:2062 and grade 1 of IS:432 in concrete along with nuts, lock nuts (as per IS:1363, 1364 and IS:3138), washers, anchor plates, stiffener plates, protective tape, pipe sleeves, templates etc. including welding, cutting, grinding, threading, drilling etc. all complete.	MT	10	.0013886
703.0	Same as above items 701 with BHEL supplied material (scrap) free of cost including Fabrication,loading, transportation, unloading and Erection etc. all complete from BHEL store to plant site.	--		
a	Mild steel embedments, inserts, pipe sleeves, angle pieces, rungs of various diameters, plates of dimensions as required etc.	MT	20	.0007229
A703	Fixing of embedments, inserts, pipe sleeves, angle pieces, anchor bolts of various diameters, plates of dimensions as required etc. including scaffolding, setting in position, transportation from BHEL site stores to work spot etc. all complete.	MT	20	.0006702
704.0	Supplying, fabricating, erecting and installing following items in concrete/brickwall for all kind of works, including setting material in concrete, layout, scaffolding, cutting, forming, grinding, drilling, bolting, welding, jointing, testing etc. all complete.	--		
a	MS pipes of all diameters	Kg	20	.0000026
b	PVC pipes / conduits of all diameters	Kg	20	.0000106
c	UPVC pipes / conduits of all diameters	Kg	20	.0000113

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
Ad	Providing and fixing carbon steel galvanized (minimum coating 5 micron) anchor fastener (Hilti HRD) of double threaded 6.8 grade (yield strength 480 N/mm ²) or equivalent of safe tensile capacity as specified below for brick work with two part expansion polyamide A6 grade sleeve.	--		
i	8mm Dia	EACH	20	.0000033
ii	10mm Dia	EACH	20	.0000042
iii	14mm Dia	EACH	30	.0000114
Ae	Mechanical expansion fasteners, cold formed stud type having 3 way expansion sleeve of SS 316 grade approved for use in cracked concrete and seismic design with ETA C1/C2 approval or equivalent of safe tensile capacity as specified below for concrete work.	--		
i	HST3 M8	EACH	20	.0000042
ii	HST3 M10	EACH	10	.0000029
iii	HST3 M12	EACH	20	.0000073
iv	HST3 M16	EACH	20	.0000145
v	HST3 M20	EACH	10	.0000117
Af	Adhesive type Chemical anchor fastener consisting of slow curing epoxy chemical adhesive and threaded rod of carbon steel (minimum grade of 5.8) including nut and washer usable in diamond core drilled holes and in wet/ water submerged holes dispensed through mechanical dispenser HIT RE 500 V3 or equivalent of safe tensile capacity as specified below for concrete work.	--		
i	HIT-V M8	EACH	10	.0000051

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
ii	HIT-V M10	EACH	10	.0000065
iii	HIT-V M12	EACH	10	.0000086
iv	HIT-V M16	EACH	10	.0000175
v	HIT-V M20	EACH	10	.0000263
vi	HIT-V M24	EACH	10	.0000577
Ag	Designing, supplying and fixing rebars in already cast concrete, including drilling, cleaning hole with air blow-out & wire-brush and injecting ETA certified epoxy based chemical HIT RE 500 V3 or equivalent for rebar fixing in dry, water saturated condition/submerged holes conditions for 8mm-32mm dia. with the help of dispenser into a hole diameter and depth as per manufacture specification. Chemical should be made of two components consisting of resin and hardener in the ratio 5:1 in a foil pack of 330/500ml.	--		
i	8mm Dia	EACH	10	.0000042
ii	10mm Dia	EACH	10	.0000068
iii	12mm Dia	EACH	10	.0000091
iv	16mm Dia	EACH	20	.0000335
v	20mm Dia	EACH	20	.0000524
vi	25mm Dia	EACH	20	.0000786
800.0	GROUTING: Grouting including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, roughening surface, cleaning, ramming, curing etc. at all level , drawings and as directed by engineer - in - charge.	--		

Part C : Bill of Quantities**Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works****at 5 X 800 MW Yadadri TPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
801.0	Providing & grouting with cement slurry mix of approved ratio using pressure pump for water retaining concrete structures as per approved procedure including cost of nipples/ nozzles, cement, admixture, curing, pressure pumps, slurry agitator etc. all complete. Cost shall include fixing of nipples at maximum 500 mm centre to centre spacing, cutting of nipples after completing of grouting, making good of the nipple hole with appropriate non-shrink cement paste, water tightness test etc. all complete wherever specified in the drawing. Cement will be supplied by BHEL free of cost.	SQM	20	.0000207
803.0	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 as per specification, drawing and direction of engineer-in-charge. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor). Cement will be supplied by BHEL free of cost.	CUM	5	.0001465
804.0	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 as per specification, drawing and direction of engineer-in-charge. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	10	.0007217
805.0	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-2 or equivalent as per specification, drawing and direction of engineer-in-charge.(Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	2	.0001561
806.0	Providing Chemical (epoxy) injection grouting with pressure pump for water retaining concrete structures conforming to IS:6494, including fixing nozzles, cost of approved chemical, admixture, curing etc. all complete . Payment shall be made as per the consumption of chemical grout.	Kg	10	.0000326

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1000.0	BRICKWORK: Brickwork masonry including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding etc. at all levels as per specification, drawings and as directed by engineer - in - charge. (Cement supply by BHEL free of cost)	--		
1001.0	Providing brick work in cement mortar 1:6 (1 part cement : 6 parts coarse sand) in walls, chambers etc. in thickness varying from 230mm to 460mm at all depths, places and positions below plinth including raking out joints, curing, scaffolding etc. complete excluding plastering and painting.	--		
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	CUM	50	.000467
1002.0	Providing brick work in cement mortar 1:6 (1 cement : 6 coarse sand) in walls, chambers etc. in thickness 230mm at all heights, places and position above plinth including raking out joints, curing, scaffolding etc complete excluding plastering and painting.	--		
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	CUM	50	.0005651
1003.0	Providing brick work in cement mortar 1:4 (1 cement 4 coarse sand) in partition walls, chambers etc. in thickness 115mm at all heights, places and position above or below plinth/graded level including providing two nos. 6 mm diameter MS bars at every third layer, raking out joints, curing, scaffolding etc complete excluding plastering and painting as per specification.	--		
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	SQM	50	.0000692
1800.0	MISCELLANEOUS: Miscellaneous works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level unless otherwise specified as per specification, drawings and as directed by engineer - in - charge. Cement will be supplied by BHEL free of cost.	--		

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1807.0	Anti termite chemical treatment of soil with Chlorpyriphos/Lindane E.C. 20% with 1% concentration conforming to IS:8944 and as per IS 6313 all complete. (Plinth area of building at ground floor only shall be measured for payment).	SQM	10,000	.0020698
A1808	Laying of Earthing Mat (Main Grounding Conductor), transportation from yard stores, loading, unloading, cutting to length, welding, protective painting of joints etc. all complete. (Excavation & Back filling shall be paid separately under respective item of earth work. Earthing mats/rods shall be supplied by BHEL free of cost)	MT	200	.0030599
A1809	Construction of Treated Earthing pit as per drawing with charcoal & salt, GI pipes, earth electrodes, GI wire, GI strips, brick chamber with covers including associated earthwork etc. all complete.(Material for GI pipes, earth electrodes, GI wire, GI strips shall be supplied by BHEL free of cost).	EACH	100	.0032583
1810.0	Construction of below ground earthing system test links as per drawing/ sketches including concreting, reinforcement, formwork, providing & fixing GI strip etc as per drawing & specification (excavation & backfilling only will be paid under applicable BOQ items.	NO.	75	.0008578
1811.0	Construction of below ground earthing system earth electrodes as per drawing and specification. (Excavation and backfilling only will be paid under applicable BOQ items)	EACH	75	.000224
1812.0	Construction of below ground earthing system - Earth connection and riser pig tails as per drawing and specification. (Excavation and backfilling only will be paid under applicable BOQ items& steel shall be supplied by BHEL free of cost.)	EACH	1,000	.0025662
A1813	Construction of Electronic Test Pit with charcoal & salt, GI pipes, GI earth electrodes, GI wire, GI strips, brick chamber with covers including associated earthwork etc. all complete.(Material for GI pipes, GI earth electrodes, GI wire, GI strips shall be supplied by BHEL free of cost)	EACH	5	.0001629
1822.0	Providing & filling Bentonite Powder (Sodium base) mixed with water in electronic earthing pit as per drawing & direction below ground level including all materials, transportation, labour, incidental etc all complete as per specification.	CUM	5	.0000597

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1827.0	Anti weed chemical treatment of soil with suitable chemical pertaining to the types of weeds found in the vicinity including providing anti-weed/ soil sterilization test certificate, performance guarantee of three years etc. all complete.	SQM	1,000	.0000067
1832.0	Providing and fixing sliding layer of bitumen paper or craft paper over the screed layer for water retaining structures to destroy the bond between the screed and the base slab concrete of the water retaining structure etc all complete.	SQM	500	.0000126
A1839	Providing Chemical injection grouting with pressure pump for water retaining concrete structures conforming to IS:6494, including fixing nozzles, cost of approved cement, admixture, curing etc. all complete . Payment shall be made as per the consumption of chemical grout.	Kg	100	.0002605
A1840	Dismantling old existing reinforced/non-reinforced brickwork/ blockwork/ stone masonry work in mud/lime/ cement mortar at any level including clearing/cleaning, stacking the serviceable materials at plant site and disposal of unserviceable materials within a lead upto1km all complete.	CUM	20	.0000391
A1841	Rebate over ST No. A1840 for taking into account the deemed cost of all serviceable material which bidder will be getting out of it by taking them outside plant for bidder's purpose instead of stacking at plant site.	CUM	20	-.0000029
a.	For the design load of 3MT	--		
i	16mm dia bar with 28dia drill hole	Each	100	.0001026
ii	20mm dia bar with 32dia drill hole	Each	100	.0001497
iii	25mm dia bar with 40dia drill hole	Each	100	.0002214
b.	For the design load of 5MT	--		
i	16mm dia bar with 28dia drill hole	Each	100	.000124
ii	20mm dia bar with 32dia drill hole	Each	100	.0001684

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
iii	25mm dia bar with 40dia drill hole	Each	100	.0002567
c.	For the design load of 10MT	--		
i	20mm dia bar with 32dia drill hole	Each	100	.0002125
ii	25mm dia bar with 40dia drill hole	Each	100	.0003276
iii	28mm dia bar with 40dia drill hole	Each	100	.0004161
2300.0	STRUCTURAL WORKS: Structural steel works including all labour, material (unless otherwise specified in BOQ/contract specification), equipments unless otherwise specified, transportation, handling etc. at all level as per specification, drawings and as directed by engineer - in - charge.	--		

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2301	Fabrication,erection and alignment of structural steel with mild steel rolled section / built up section / combination of both conforming to IS:2062, pipes conforming to IS:1161/ IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames,hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails etc, connection design & preparation offabrication drgs, collection of steel from stores, fabrication, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of20degree C for welding over 20 mm and upto 40 mm & 66degree C for welding over 40 mm and upto 63 mm & 110degree C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, 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,, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), return of surplus / waste steel materials to store etc all complete. Including appointment of a separate agency, approved by BHEL, for review and approval of fabrication drgs, in consultation with BHEL. (Rate shall be exclusive of surface preparation) (Structural steel for the above shall be supplied by BHEL free of cost as per the terms and conditions specified elsewhere in the contract)	--		
a	For Built up sections composed of Structural plates only (Grade E250) including stifeners e.g. plated columns, girders, etc. (other than coal bunker)	MT	1	.0000394
b	For built up section composed of rolled sections (Grade E250) or rolled sections (Grade E250) and plates (Grade E250) including stiffeners (other than coal bunker)	MT	1	.0000394

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
d	For all other items (Grade E250) not covered above e.g. rolled sections, pipes, chequered plate etc	MT	1	.0000394
A2302	Extra over ST No. A2301 for surface preparation by blast cleaning of steel structures as per IS:1477 (Part 1 and 2) and applying epoxy resin based zinc rich primer as per IS:14589 in 2 coats, one at shop and second coat after erection, including touch-up painting etc all complete.	MT	1	.0000093
B2302	Extra over ST No A2301 for blast cleaning of steel structures to near white metal surface(Sa 2 1/2) and applying coating of inorganic zinc silicate primer in one coat @ 65-75 micron DFT /coat at shop immediately after blast cleaning, including touch-up painting etc all complete.	MT	1	.000009
A2305	Providing and applying two coats of epoxy paint with minimum 25 micron total dry film thickness (DFT) per coat 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 115 microns including protection and cleaning, scaffolding etc. all complete.	MT	1	.0000083
B2305	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 115 microns including protection and cleaning, scaffolding etc. all complete.	MT	1	.0000042
2307.0	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.	--		
a	Minimum galvanisation of 610 g/sqm	MT	1	.0001295

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1841 for Civil Works - Foundations, Civil works TG, Fans, CW encasing & other miscellaneous foundation works

at 5 X 800 MW Yadadri TPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2308	Supplying, fabrication, erection and alignment of factory made welded grating units with mild steel 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 2 coats of redoxide zinc-chromate primer (one coat at shop and one coat after erection), fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete.	MT	5	.0004973
A2309	Extra over above ST NO. A2301/A2308 for finishing the grating units with hot dipped galvanisation @ 610 gm/sqm over blast cleaned steel surfaces instead of painting with two coats of red oxide zinc-chromate primer all complete.	MT	1	.000023
TOTAL Weightage				1.0