



INPUT OF PSWR FOR TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



CONTENTS

Sl No	DESCRIPTION	Chapter
Volume-IA	Part-I: Contract specific details	
1	Project Information	Chapter-I
2	Scope of Works and Technical Specifications	Chapter-II
3	Facilities in the scope of Contractor/BHEL (Scope Matrix)	Chapter-III
4	T&Ps and MMEs to be deployed by Contractor	Chapter-IV
5	T&Ps and MMEs to be deployed by BHEL on sharing basis	Chapter-V
6	Time Schedule	Chapter-VI
7	Terms of Payment	Chapter-VII
8	Taxes and other Duties	Chapter-VIII
9	Manpower deployment	Chapter-XII
10	Technical Specifications and Plot Plan	Chapter-IX
11	Appendix	Chapter-X
12	Bill of Quantities and % Weightage of Individual Items	Chapter-XI

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - I: PROJECT INFORMATION

1.0	Project Information:
1.1	<p><u>INTRODUCTION:</u></p> <p>The proposed site is located at Bhilai (East) in Durg district of Chattisgarh.</p> <p>Latitudes : 21.21⁰ N Longitudes : 81.38⁰ E Place : Bhilai (East) District : Durg Nearest Railway Station : Bhilai (4KM) Nearest Airport : Raipur (35KM) Nearest Town/City : Bhilai (10KM)</p> <p>Above information furnished are for general guidance of Contractor. However, Contractor has advised to visit the site and appraise himself about the conditions of site and infrastructure available in the area for fulfilling their commitments under the contract.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

2.0 SCOPE OF WORK

GENERAL SCOPE OF WORK

This tender specification for Civil, Architectural & structural steel works includes detailed design, engineering, inspection, supply of raw materials, consumables, & bought out items, shop/factory fabricated steel structures in shop/factory approved by BHEL/NTPC/NSPCL, storage, handling/transportation of raw materials/ finished products /structures for construction and fabrication & erection activities at site for all facilities of 2x250MW NSPCL Bhilai FGD Project and handing over the facilities/structures to BHEL/employer for further equipment installation and commissioning as per the scope defined in **Section-A** of the tender documents. The detailed scope of work and the technical requirements for the work to be executed under this specification shall be as per the approved drawings, technical specifications enclosed in section-C and Section-D of the tender documents.

Any other building/facility/structure that would be required as per system design requirements but not covered in Section-A of the tender documents is also in the scope of the bidder.

2.1 CIVIL, ARCHITECTURAL & STRUCTURAL WORKS

This tender specification for civil, architectural structural works covers construction of all the civil, architectural and structural works related to buildings, foundations, equipment foundations, steel structures etc., which includes earth work, foundation works, plain & reinforced cement concrete, reinforcement, scaffolding, form work, shoring & strutting, masonry work, floor finishes including dado & skirting, plastering, painting, roof finishes, doors, windows, fire proof doors, grouting, ventilators, rolling shutters, internal & external plumbing, earthing mat/grid with earth pits, water supply, water proofing, drainage & sewerage, fencing, gates, roads, MS embedment and foundation bolt / anchor bolts etc. including supply of all materials, consumables, labor, tools & plants, transportation and storage, quality control, sample testing etc. all complete as per specifications and approved drawings for proper and successful execution of the job of all required facilities of 2x250MW NSPCL Bhilai FGD Project including completion of Chimney works in all respect i.e., including earth works, foundation, RCC works, fabrication & erection of steel flue cans, mini shell of Titanium, suitable lining on Inner surface of Steel Flue CAN, wet stack model study, supply & erection of shop fabricated structural platforms, Supply & installation of elevator, earthing mat/grid with earth pits, electrical items & other items in conformity with the approved layout & technical specifications. Structural works includes preparation and approval of fabrication drawings, supply and erection of shop/factory fabricated steel structures in shop/factory approved by BHEL/NTPC/NSPCL, supply, fabrication and erection of structural steel works at site, stainless steel liner, chequered plates, hand rails, gratings, PTEF bearings, deck sheet, cladding sheet, high strength bolts/ friction grip bolts, washers and nuts, supplying and applying of paints etc.

2.2 ALSO INCLUDED IN THE SCOPE

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

Unless otherwise specified, the work to be provided by the contractor for the items shall include but not be limited to the following:

1. Furnishing all labour, materials, supervision, construction plans, equipment, supplies, transport to & from the site, fuel, electricity, compressed air, water, transit and storage insurance and all other incidental items and temporary works not shown on specified but reasonably implied or necessary for the proper completion, maintenance and handing over the works, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by the engineer during the course of works.
2. Dismantling of existing pavements/facilities for construction of FGD works and restoration of the same as per requirement.
3. Enabling works for establishing infrastructures including approach road, storage open/close facilities etc. without any extra cost to BHEL.
4. The work shall be carried out both below and above ground level and shall include basements, equipment foundations, grouting, slabs, beams, columns, footings, rafts, walls, steel frames, brick walls, stairs, trenches, pits, access roads, culverts, buildings, finishes, complete architectural aspects, drainage, sanitation, water supply etc.
5. Access roads to all buildings/facilities including construction and maintenance of temporary access roads for approach to the building/facilities for construction/erection activities.
6. Supply and erection of shop fabricated steel structures as applicable in line with technical specifications with prior consent/ approval of agency/shop for fabrication of the steel structures.
7. Furnishing samples of all materials required by the engineers for testing / inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.
8. Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer.
9. Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that is required for all works including temporary works.
10. Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.
11. Carrying out required survey and establish levels and coordinates at suitable intervals from existing grid levels and coordinates furnished by the owner established bench marks, setting out the locations and levels of proposed structures, constructions and marking of reference pillars and other identifications works etc as required. The contractor shall provide the owner / BHEL such an assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used.
12. Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract. Quality of work to customer's satisfaction and system requirements is the essence of these certifications. The contractor in all respects will organize his work, systems,

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

environment, process control documentation, tools, plant, inspection, measuring and testing equipments etc. as per instructions of BHEL engineer. The contractor shall also comply with applicable legislation and regulations with regard to health, safety and environmental aspects for minimizing risk arising from occupational health, safety hazards, controlling pollution and wastages.

13. The customer M/s NSPCL and / or their consultant may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works at no extra cost to BHEL. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL Engineer, without any cost implications to BHEL.
14. The scope of work also includes attending meetings at BHEL office at site / BHEL Nagpur office, BHEL engineering centers/Units, Owner's place in Site or at places decided by Owner as and when necessary for review, discussions, coordination, etc.
15. The scope of work also includes setting up batching plant with capacity of minimum 30 Cum. All machineries, cranes, equipments, tools tackles including transit mixer, vibrating needle, dewatering pump, roller, compactor, admixture etc. to be made available prior to concreting activity. All test samples to be taken in presence of BHEL/NTPC/NSPCL Engineer and joint protocol to be maintained by contractor.
16. Contractor shall set up suitable storage facilities for Cement, sand, deck plate, bolts, aggregate, reinforcement steel, structural steel, shop fabricated steel structures, suitable lining materials for Chimney, handrail, grating, foundation bolts, metal deck, cladding sheet, shuttering item, inserts, water proofing material, admixture other BOI's etc and all are stored properly as per IS recommendation/technical specifications/manufacturer recommendation. Wastage due to lapse of storing will be because of contractor.
17. All item to be supplied as per customer/ NTPC specification with prior approval from NTPC/NSPCL/BHEL.
18. Contractor shall maintain proper records of test reports, bar bending schedule and to be produced to concerned Engineer whenever required.
19. Contractor shall be responsible for coordinating with the erection agency as well as BHEL for maintaining proper line, elevation, coordinate as per drawing. Any mismatches/ fouling with existing structure to be highlighted to BHEL. Dismantling of structure due to lack of coordination/Survey will be on contractor's account.
20. Installation & Testing of Bored cast-in situ piles of required dia and length as specified in contract document, if applicable. Piling shall be carried out in accordance with IS2911 (relevant parts) and accepted construction methodology. Construction methodology shall be submitted by contractor for BHEL/NTPC/NSPCL approval. Pile Installation Registers shall be prepared containing all important details such as pile no, date/time of start/completion, pile dia, bored depth, Levels, pouring start/end time etc as per technical specification.
21. Preparation and obtaining approval from BHEL/NTPC/NSPCL for construction methodologies/ procedures.
22. Pile tests shall have to carried out as per applicable IS/ASTM standards including but not limited to vertical load tests, lateral load tests, High Strain Dynamic load tests etc.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

The rates quoted shall be inclusive of making arrangements and getting the tests done as per approved FQP/IS 2911 (part IV) standard/ASTM D 4945 standard and as per technical specification.

23. Excavation of earth and backfilling including dewatering of excavations for foundations, trenches, pits, etc. till the construction of the same is completed and disposal of surplus earth.
24. Construction of bored cast-in-situ piles, pile caps with pedestal for all civil structures, trenches, tunnels, sumps, grade beams, tie beams at foundation level, grade slabs, floor slabs and roof slabs at any height, equipment foundations etc.
25. Preparation and submission of detailed calculations, arrangement drawings and detail drawings of formwork, staging and scaffolding for all reinforced concrete structures and foundations as directed by the Engineer for his checking and approval.
26. Preparation of detailed working drawings and bar bending schedule for all reinforced concrete work and getting them approved before start of work by the BHEL Engineer.
27. Taking delivery of materials (BHEL Scope) from BHEL stores/ storage yards for utilization in construction work under this package.
28. Fabrication and fixing of templates/frames, inserts, fixing of anchor bolts, sleeves, and embedments etc. in concrete.
29. Supply of all instruments and personnel for conducting necessary tests at site as specified/as directed by the Engineer.
30. Arranging for joint checking (with BHEL/BHEL's Customer/ Consultant) of all site construction activities Preparation of joint protocols for each & every activity and maintaining quality records for audit/inspection as per approved FQP by BHEL.
- 31. The drawings enclosed with this tender are intended to give the tenderer a general idea of the type and extent of work involved. The drawings are as such only indicative. Detail, mechanical/electrical drawings as inputs will be issued after the award of contract as per the mutually agreed schedule. Bidder to develop designs and drawings of civil and structural, get it approved by BHEL/customer. After approval of the civil and structural drawings, bidder shall release the drawings for construction in consultation with BHEL.**
32. The scope of work will also include such other related works although they may not be specifically mentioned in the above paragraph and all such incidental items not specified but reasonably imply and necessary for completion of the job as a whole all as desired and as directed by the engineer.
33. In case of any discrepancy between item description, relevant drawing and/or specification Clarification shall be sought at tender stage itself. Otherwise it shall be assumed that the bidder has quoted for the more stringent requirement.
34. Mix design (M 20, M 25, M 30, M 35/M40) for all concreting shall be carried out either at site or from a reputed institute, contractor has to ensure adding of admixture and minimizing of cement content in line with IS 456 as advised by BHEL time to time without any additional cost.
35. The scope shall also include setting up by the bidder a testing laboratory (one AC lab size 4.5mtrx6mtr and 1 non AC lab 4.5 mtrx4.5 mtr.) in the field to carry out all

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

relevant tests. Detail of laboratory equipment's as per NTPC specification to be arranged by the contractor within quoted rate for conducting day to day tests. The contractor may tie up with approved/registered inspection agencies for setting up test lab at site as described above.

36. Installation of necessary amenities- temporary infrastructure for construction activities at Project site locations- following are the minimum amenities to be provided by the bidder without any extra cost and removal/disposal of the same in environment friendly manner after its intended use/completion of complete scope of work:

- Labour rest sheds near work spot.
- Canteen facility creation.
- Drinking water facility.
- Labour toilets near work spot in sufficient nos. with regular cleaning & maintenance arrangement
- Labour colony should have all hygienic condition, dining hall, toilets, proper sewerage system, good drinking water arrangements.

NOTE: In case of non-compliance of above points, BHEL will make penal recoveries at the rate decided at site mutually by BHEL and contractor or as imposed by NTPC/NSPCL.

37. **Setting Up of Laboratory Works:** The contractor shall set up his own laboratory in the very close vicinity of the work site as per indicative field QA&QC laboratory set up (enclosed with this tender document) and as the directions of engineer-in-charge. The laboratory shall be equipped with latest testing equipment in sufficient number to carry out all the tests as required under a contract. The contractor should ensure that the equipment is available well in advance of starting of the work to avoid stoppage of work on this account. All the tests shall be carried out by the contractor in the presence of the Engineer's representative and a joint record of all observations and results thereof shall be maintained, and available with the Engineer.

2.3 **WORKS BY OTHERS**

No work under the specification will be provided by any agency other than the contractor unless specifically mentioned elsewhere in the contract. BHEL shall provide **Free issue materials reinforcement steel, TMT FE500D quantity limited to 1110MT (+/-) 2% as per following tentative details:**

Sl No	TMT(dia.)	Quantity (MT)
1	8	100.000
2	10	50.000
3	12	49.557
4	16	189.337
5	20	99.279
6	25	472.580
7	28	74.915
8	32	74.012

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

Free issue of plates/bolts/stool/embedment/pipe/rod for installation at site		
9	Bolts, /EP, /Stool/Embedment's	5.00 MT
10	Earth mat MS road, 40 dia	30.00 MT
11	CI pipe 100 ID	40 meter

2.4 SITE VISIT

The tenderer are advised to physically visit the site and fully acquaint themselves with site conditions, transportation routes, various distances and the fact that other contractors would be working in this area their structures are to be protected. The material brought and stacked for construction should not make hindrance to other contractors. Necessary precaution and arrangements including sprinkling of water during work as acceptable to BHEL for safety & security for the above have to be made by the contractor. No claim will be entertained by BHEL on ground of lack of knowledge and the contractor's rates shall be deemed to have taken this into account. The contractor, in the event of this work awarded to him, shall establish an office at site and keep posted an authorized, responsible officer with valid Power of Attorney for the purpose of the contract. Any order or instructions of the engineer or his duly authorized representative, communicated to the contractor's representative at site office will be deemed to have been communicated to the contractor at his legal address.

2.5 CONSTRUCTION POWER:

Construction power (three phase, 415 V/ 440 V) will be provided near the site at a distance of approx. 500M on chargeable basis (source of construction power shall be provided at two locations). Further distribution shall be arranged by the contractor at his own cost and services. Contractor shall be responsible for fulfillment of all requirements including statutory requirements in this regard. Contractor shall deploy and install required energy meter, cables, fuses, LT distribution boards, switchboards, bus bars, earthing arrangements, protection devices i.e, required capacity ELCB/RCCB in outgoing feeders and any other installation as specified by statutory authority/act. Contractor shall also obtain approvals of appropriate authority and pay necessary fees, levies etc towards the clearance of such installations, prior to use. Sufficient power factor compensation equipments like capacitor shall be provided by contractor for reactive loads like welding machines etc. In case of any fine/penalty on account of low power factor, same shall be shared by contractor proportionately according to power consumption.

1. Contractor shall make necessary arrangements for onward distribution of construction power taking due care of surrounding construction activities like movement of cranes & vehicles, civil work, fabrication/construction/assembly/erection etc and safety of personnel. It may become necessary to relocate some of the installations to facilitate work by other agencies or by him.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

2. It shall be the responsibility of the Contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements. The installation and maintenance of this shall be done by licensed and experienced electrician.
3. While reasonable efforts will be made to ensure continuous electric power supply, interruptions cannot be ruled out and no claim from the Contractor shall be entertained on this account such as idle labor, extension of time etc. The Contractor shall adjust his working shift accordingly and deploy additional manpower, if necessary, so as to achieve the target.
4. Contractor shall be well equipped with back-up power supply arrangement like DG set and diesel operated welding machine etc to tackle situations arising due to failure of supplied power, so as to ensure continuity and completion of critical processes that are underway at the time of power failure or important activities planned in immediate future.
5. BHEL is not responsible for any loss or damage to the Contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.
6. Contractor is advised to maintain the calibrated energy measuring instruments and use their system as efficiently as possible. to maintain the HT side input energy meter reading and LT side outgoing energy meter reading to sub-contractors as equal. In case there is any difference between the sum of the LT side meter readings of all sub-contractors and the HT side meter reading of M/s NSPCL, same shall be distributed proportionately among all sub-contractors working during the respective calendar month.
7. The bidder will have to Procure & install General mobile illumination system during construction right from start of his work. This system will include temporary pole lighting, portable lighting towers with DG back-up, within the quoted price. The illumination should be such that minimum illumination requirement as specified by Indian standards for general illumination is maintained.
8. The charges only for the actual energy consumed by the contractor shall be recovered based on prevalent rate of DISCOM.

GENERAL: - If any other voltage level (other than normally available) is required, the same shall be arranged by the contractor from power supply as above. Contractor will have to provide at his own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized / accredited agency for working out the power consumption. In case of recalibration required for any reason the necessary charges including replacement by calibrated meters is to be borne by the contractor. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules and Regulation as applicable. The contractor shall ensure usage of electricity in an efficient manner and the same may be audited by BHEL time to time. In case of any major deviation from normally

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.

2.6 **CONSTRUCTION WATER:**

Contractor shall make all arrangements himself for the supply of construction water as well as potable water for labour and other personnel at the work site/ colony. Any statutory clearance required shall be obtained by the contractor. Assistance, if required shall be provided by BHEL/NSPCL.

2.7 **LAND**

BHEL shall allot land to the contractor if customer NSPCL allots the same to BHEL for his office & stores. Contractor must maintain the areas allotted to him in a neat and clean condition as required by the Employer. The contractor shall provide adequate storage, testing and office facilities with approval from the engineer. The rate quoted by the contractor shall be deemed to include for these and no separate payment will be made towards these. On completion of work, the site shall be cleaned by the contractor of all materials, temporary sheds, debris, rubbish plants and equipments, belonging to the contractor at no extra cost. The site and surroundings shall be handed over in neat and clean conditions. Contractor shall do periodical housekeeping as per the instructions of BHEL and NSPCL at no extra cost. In case of any failure by the contractor, the employer will get set at risk and cost of the contractor.

2.8 **FIELD QUALITY ASSURANCE:**

The contractor shall prepare, submit and obtain approval from BHEL/NSPCL/ NTPC of Field quality plan in line with technical specifications. The contractor shall be responsible for day-to-day quality checks of concrete, steel structures fabrication & erection, and other building materials during the progress of work. All quality records and log sheets shall be maintained as per the requirement of BHEL/BHEL'S customer and as per field quality plan approved by **BHEL/NTPC/ NSPCL**.

2.9 **MANUFACTURING QUALITY PLAN:**

The contractor/its agency shall prepare, submit and obtain approval from BHEL/NSPCL/NTPC for fabrication of shop fabricated steel structures and other items as applicable in line with technical specifications. All quality records and log sheets shall be maintained as per the requirement of BHEL/BHEL'S customer and as per manufacturing quality plan approved by BHEL/NTPC/NSPCL.

2.10 **HANDLING OF MATERIALS ISSUED BY BHEL:**

2.10.1 Materials shall be issued by BHEL based on the weight basis/ linear measurements & sectional weight. However, on specific request of the contractor **"as a special case to expedite the job"** the consignment received at BHEL stores can directly be diverted to the work site following issuance procedure of BHEL. Such direct issues shall be as per the Challan/dispatch document/LR received with the consignment. In such cases, Contractor shall do unloading of materials from trucks/lorry at their own cost.

2.10.2 All materials shall be stacked, stored above ground level **by use of concrete or wooden sleepers. No materials shall remain on ground at any time.** All concrete or wooden sleepers required for stacking the materials shall be

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

arranged by contractor (successful bidder of this package) at his own cost within the quoted rates. All other equipments like winches, D-Shackles, slings of various sizes, max puller, pulley blocks, jacks, trucks, trailers etc. Required for such handling of steel from BHEL stores/storage yard etc. Shall be arranged by contractor within quoted/accepted rates.

2.10.3 The contractor shall take delivery of the materials from the designated place within the project premises at his own cost and store the same at his stores as per standard norms. Open land for such purposes shall be provided by BHEL on free of cost basis. Temporary barbed wire fencing of the open storage yard is to be done by the contractor and is included under the scope of his work. Contractor shall also remove grass, bushes, trees etc. wherever required off the land provided to him and shall make proper continuous up keeping of the open yard /land by removing grass, bushes trees etc and same is included under the scope of his work & No extra payment shall be made to the contractor in this regard. The bidder shall make complete arrangement of necessary security personnel's to safeguard all such materials in his custody. Materials issued will be used only for construction of permanent works. The contractor shall take care of material issued by BHEL and shall protect the same from theft, damage and weathering. Excessive rusting of steel in custody of agency/contractor must be avoided. In case, due to any cause attributable to the contractor, such rusting of steel occur rendering the same unusable, then such quantity of steel shall be replenished by the contractor without any cost & time implication to BHEL.

2.10.4 In case of theft/damaged of BHEL issued material, contractor shall arrange the material without any cost & time implication.

2.11 **ISSUE OF STEEL (in limited qty mentioned elsewhere).**

2.11.1 The steel shall be issued to the contractor on the following basis:

- i. ~~Structural Steel: Weighment basis (Unit—MT)~~
- ii. Reinforcement Steel and Earthing Rod, foundation bolts: Weighment basis (Unit—MT)
- iii. ~~GI Gratings: Weighment Basis(Unit—MT/As Received from manufacturer)~~
- iv. ~~MS Rails: Weighment Basis (Unit-MT)~~

2.11.2 All the steel (~~structural~~, reinforcement, earthing rod/GI flats, GI gratings, foundation bolts, MS Rails) issued by BHEL shall be properly accounted for. The total quantity of steel required for the work will be calculated from the approved Bar Bending schedule, fabrication drawings, approved laps, chairs and lugs etc. The measurement for payment as well as for accounting shall be based on the sectional weights as indicated in the following IS/BS/EN specifications.

Sr No	Name of Standard	Name of Section
1	IS: 808-1964	Beams, Channels and Angles
2	IS: 1730-1961	Plates, Sheets and Strips/Flats

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

In	3	BS4-1: 1993	UB/UC sections
	4	IS: 12778/equivalence with EN-19-57	For NPB sections
	5	IS: 12778/equivalence with EN-53-62	For HE/WPB sections
	6	IS: 1786 or grade -1 of IS432 (Part-I)	Rounds including deformed high yield strength bars.

case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding.

- 2.11.3 The steel issued to the contractor shall be mainly in standard length and sections as received from the supplier. However, the contractor shall be bound to accept the steel in length as available in the project stores, no claims for extra payment because of issue of non-standard length will be entertained.
- 2.11.4 The contractor shall satisfy himself of the quality and quantity of the materials at the time of taking delivery from BHEL stores. No claims whatsoever will be entertained by BHEL because of quality or quantity after the materials are taken by the contractor from BHEL stores.
- ~~2.11.5 The contractor shall submit to BHEL, a statement indicating estimated quantity of cement and steel required during a quarter. In addition, the contractor shall also furnish the estimated requirement of steel during a month by the third week of the previous month indicating his requirement.~~
- ~~2.11.6 Following shall be limit for the maximum quantity of BHEL issue materials that would be with the contractor at any point of time when work is in progress (excluding what has already been incorporated in the works).~~

SL No.	ISSUE OF MATERIALS	MAX QUANTITY IN CONTRACTORS STORE
01	Reinforcement steel, earthing rod/GI flat, GI grating, Foundation bolts,	ONE MONTH
02.	Cement	ONE MONTH

- 2.11.7 Bidders shall ensure that no lamination material is taken over by them from BHEL.
- ~~2.11.8 The contractor must note that cement and steel required for the contractor's enabling job like store/ site office/batching plant/temporary woks etc. shall be arranged by the contractor at his own cost.~~

2.12 RETURN OF MATERIALS

- ~~2.12.1 **Return of Cement:** Sealed cement bags remaining unused and in perfectly good condition at the time of completion or termination of the contract shall be returned promptly, (within 15 days from assessment) if BHEL/ engineer is satisfied of the physical condition of the cement. Return of such cement to the~~

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

project stores / place as identified within the project area by engineer/ BHEL will not be entitled to handling and incidental charges. Surplus sealed and good conditioned cement bags will be taken back on weighment basis.

- 2.12.2 **Return of Reinforcement Steel and Structural Steel including Scrap:** All surplus steel and all wastage materials will be taken back on weighment basis. Surplus, unused and untampered steel shall be sorted section-wise and returned separately at a place directed by BHEL/Engineer within the project area. Return of such materials will not be entitled to any handling and incidental charges. All wastage / scrap (including melting scrap, wastage, and unusable scrap) shall be promptly returned to the stores and a receipt obtained for material accounting purposes. Return of such material will not be entitled to any transportation and incidental charge. Scrap for reinforcement steel and structural steel shall be returned separately.

2.13 **Scrap and Serviceable Materials:**

- 2.13.1 ~~All structural steel of length above 2 M except M.S Plate shall be considered as **serviceable materials** provided the materials is in good and acceptable condition. Structural steel in length less than 2 M Shall be treated as scrap.~~
- 2.13.2 ~~Plates having both side greater than 1 Meter OR if any side is less than 1 M but greater than 0.5 M and the total area is equal or greater than 2 sq. Meter shall be considered as **serviceable material**.~~
- 2.13.3 ~~All pipe measuring 2 M and above in length shall be treated serviceable materials provided they are in good and acceptable condition. Pipe in less than 2 M length shall be treated as Scrap.~~
- 2.13.4 All TMT measuring 3 M and above in length shall be treated as **serviceable material** provided they are in good acceptable condition. TMT in less than 3 M shall be treated as scrap.

2.14 **Cement, Steel Consumption and wastage for BHEL issued material:**

2.14.1 **Reinforcement Steel, MS earthing rod, GI gratings, Foundation bolts and MS Rails Consumption**

The theoretical consumption of various sections and/or diameter of reinforcement and earthing rod steel shall be based on approved construction drawing and bar bending schedule. Weight shall be calculated considering the sectional weights as per Indian standards. No extra cost shall be payable to the contractor for any deviation in weights for the different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances.

2.14.1.1 Actual consumption = Issue – Surplus.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

2.14.1.2 Surplus = un-tampered, unused, uncut QTY of steel **including serviceable material returned** by the contractor to BHEL store along-with relevant documents.

2.14.1.3 Wastage = Actual consumption – Theoretical consumption.

2.14.2 Reinforcement Steel, MS earthing rod, GI gratings, Foundation bolts and MS Rails Wastage

2.14.2.1 **Allowable Wastage:** (+3%) of the theoretical consumption shall be considered as allowable wastage.

Wastage and scrap shall be as per actual weightment basis.		
Sl no.	Reinforcement steel & MS earthing rod	Basis of issue & penal recovery
R-1	Theoretical consumption (without considering wastage and scrap or loss)	Free
R-2	Wastage limited to plus THREE percent (+3%) of aforesaid theoretical consumption (R-1) towards allowable wastage.	Free
R-3	Wastage beyond THREE percent (+3%) of the theoretical consumption above (R-1).	Penal rate

2.15 Reconciliation of Materials:

2.15.1 The contractor shall submit a reconciliation statement of steel issued to the contractor with each RA Bill.

2.15.2 At the time of submission of bills, the contractor shall properly account for the material issued to him as specified herein to the satisfaction of BHEL certifying that the balance material are available in the contractor custody at site.

2.15.3 At the time of submission of bills, if it is noticed by BHEL that the wastage is high and calls recovery at the penal rate, then, BHEL will proceed for recovery for the excess wastage as per penal recovery rates as specified.

2.15.4 The reference drawings for actual material consumption to be used for the purpose of reconciliation shall be RFC drawings and other drawings approved by BHEL. This shall also include the bar bending schedule prepared by the contractor and approved by BHEL.

2.16 Recovery of Materials (Penal Rates) against BHEL issued material:

If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA Bills as per following penal rates:

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

Sl. No.	Items	Penal Rates (Rs.)
P-1	Cement (OPC/ PPC/ PSC).	6,500 per MT
P-2	Reinforcement steel and MS earthing rod/GI flat	65,000 per MT
P-3	MS Flats, beams, channel, angels etc. (Rolled Sections)	65,000 per MT
P-4	Foundation bolts, inserts/embedments, if supplied by BHEL	90,000 per MT

2.17 **PROCUREMENT AND TESTING OF MATERIAL BY THE CONTRACTOR:**

Material required for the entire job like reinforcement steel, structural steel, shop fabricated steel structures, chimney lining material, cement, sand, aggregates, windows, doors, ventilators, rolling shutter, sanitary fixtures, painting & finishing material, electrical fittings and wiring material and all other material required for the completion of entire scope have to be arranged by the contractor as per technical specification from approved source/supplier of NTPC/NSPCL. BHEL reserves the right to reject any material not found satisfactory. Rates quoted shall be inclusive of all such contingencies and no additional payment shall be made on this account. For this purpose, sample shall be collected at site in presence of **BHEL/NTPC/ NSPCL** representative.

NOTE: Supply of reinforcement steel, structural steel, cement shall be arranged by the contractor only from approved supplier of NSPCL/NTPC. Supply of cement shall be strictly in accordance with intended use of the same in to works as per technical specification/IS specifications and on issuance of MDCC from BHEL. In no case the use of expired cement (cement not meeting the quality requirements), shall be allowed and shall disposed by the contractor at their cost. Cement, PPC shall confirm to IS: 1489-PT-1 with 28 days Comprehensive Strength not less than 43Mpa. Ordinary Portland Cement (OPC) GR-43 as per IS: 269.

2.18 **SUPPLY OF SHOP FABRICATED STEEL STRUCTURES:**

Shall be supplied only from approved shop/factory by BHEL/NTPC/NSPCL. Contractor shall submit the fabricator/supplier credential of fabricator/supplier for obtaining approval from BHEL/NTPC/NSPCL. Contractor or its agency, approved by BHEL, shall prepare of fabrication drawings and shall start the fabrication activities on approval of the detailed fabrication drawing by BHEL/NTPC/NSPCL. Contractor shall also engage BHEL approved agency for review of detailed fabrication drawing on or behalf of BHEL without any extra cost to BHEL. Any discrepancies found in the supplied structures shall be corrected / replaced by the contractor without cost & time implication to BHEL.

Specific for Fabrication and Supply Contract

1. Items covered under this contract shall be subjected to Inspection / Testing and Quality Surveillance. The BHEL Engineer or Engineer's representative shall at reasonable times, have access to vendor's works. Quality control records. All reasonable facilities required for carrying out the inspection and testing efficiently, shall be provided by the vendor, free of cost including

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

- proper Office space with Desktop Computers/Laptop with Internet facility to BHEL/NTPC/Third Party officials for routine Check-Up and during inspection.
2. The bidder or its agency shall abide fully by all the clauses of Shop inspection and tests covered in Technical Specification. BHEL reserves the right to consider any stage of inspection / test as a “Hold Point”, beyond which work shall not proceed without acceptance of that stage.
 3. The minimum Inspection / Testing requirements shall conform to relevant codes / standards as well as Statutory Regulations applicable, whether or not specifically mentioned in the specification, in addition to those normally carried out by the vendor.
 4. Unless the Inspection / Test is waived, the Engineer or Engineer's representative shall attend the Inspection / Test within 15 days of the date of receipt of notice from the vendor, failing which the vendor may proceed with the Inspection / Test and shall forward duly certified copies of the Inspection / Test Reports. After successful completion of the Inspection / Test or receipt of Vendor's Test reports mentioned above, the Engineer shall issue within 15 days, the acceptance certificate.
 5. Wherever Customer / Consultant “Hold Points” are indicated in the approved Quality Plan an additional 10 days' notice shall be given for Inspection / Testing.
 6. Before sending written notice to the Engineer or Engineer's representative, the Vendor's own inspection staff should have fully inspected / tested the item. If the visit of the Engineer or Engineer's representative proves to be futile on account of the item not being ready for inspection / Testing or the same being rejected to reasons which could otherwise, have been detected during Vendor's own Inspection / Test, the cost incurred by Engineer or Engineer's representative on such visits shall be borne by the vendor.
 7. Approval or passing of Inspection / Test and thereby issue of the acceptance Certificates or waive of Inspection by the Engineer or Engineer's representative shall not relieve the vendor of his responsibilities and obligations under the contract and also shall not bind BHEL to accept the item should it, on further tests after receipt at destination, erection / commissioning be found not complying with the Contract.
 8. All the structures should be of standard quality and procured from BHEL/NSPCL/NTPC approved suppliers and shall conform to the provisions of the relevant Indian Standards and as per following list
 - a) Steel: Quality manufacturer's test certificates, test reports of representative samples of materials from unidentified stocks if permitted to be used.
 - b) Rivets, Bolts, Nuts & Washers: Manufacturer's certificate, dimension checks, material testing.
 - c) Electrodes: Manufacturer's certificate, thickness and quality of flux coating.
 - d) Welders: Qualifying Tests
 - e) Welding sets: Performance Tests

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

- f) Welds: Inspection, X-ray, Ultrasonic tests
- g) Paints: Manufacturer's certificate, physical inspection reports
- 9. All necessary documents such as test reports, test certificates, test curves, stress relieving charts, radio graphic films and other non-destructive tests, copies of the welding procedure, welder qualification certificates and other documents in support of adherence to Quality plan shall be furnished to the Engineer or Engineer's representative. The Quality Assurance document consisting of certified copies of all of the above complied sequentially by the vendor shall be sent to BHEL prior to dispatch.
- 10. The vendor shall provide test pieces as required by Engineer or Engineer's representative to enable him to determine the Quality of Material supplied under the contract. If any test piece fails to comply with the requirements the inspection agency may reject the whole material represented by the test piece.
- 11. In the event of inspection revealing poor quality of goods, BHEL shall be at liberty to specify additional Inspection / Test, required ascertaining Vendor's compliance with the equipment specification.
- 12. All welding shall be carried out in accordance with applicable codes or approved equal. Welding procedure and Welder's qualification shall be got approved. Welding consumables used shall be approved by the Engineer or Engineer's representative.
- 13. Approved methods of radiographic, ultrasonic or other non-destructive testing as applicable shall be used for the welding of critical components / assembly. All defects shall be rectified by the supplier at no extra cost.
- 14. If considered necessary by Engineer or Engineer's representative, multiple assemblies shall be fully erected and tested at Vendor's work prior to packing and dispatch to site.
- 15. None of the item shall be dispatched without the receipt of "Quality Surveillance Note" from the Inspection Agency as well as the written approval in the form of Material Dispatch Clearance Certificate (MDCC) unless specifically agreed.
- 16. Each separate piece of fabricated steelwork shall be distinctly marked on all surfaces before delivery in accordance with the markings shown on approved erection drawings and shall bear such other marks as will further facilitate identification and erection. This will be duly verified at site during material receipt based on which MRC shall be prepared.
- 17. To address any mismatch during erection stage, the supplier shall deploy a technical person on continuous basis at site for proper co-ordination with various agencies so that problem is attended / rectified without any time gap.
- 18. Material Despatch Clearance Certificate (MDCC) for Supply of Fabricated Structures to be issued by customer/BHEL before supply of finished material.
- 19. The affixing of Inspection Stamp on the item by the Engineer or Engineer's representative is for the purpose of identification only and shall not be considered as a token of acceptance.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

20. The above conditions are equally applicable to the agency on which the vendor has sub ordered as it shall be construed as if the works are manufactured or assembled at Vendor's own premises of works
 21. Separate storage area and Engineer shall be allotted by Bidder for BHEL contract.
 22. On receipt of approval of detailed drawings, fabricator will start fabrication job in customer approved "FABRICATION WORKSHOP / FACTORY" in line with approved drawings, specifications and quality plan. Bidder/or its fabricator shall mobilize further resources at workshop as per requirement to commence the job of fabrication, testing, shot blasting, painting etc. to match schedule of the project.
 23. The total quantity of steel required for the job will be calculated from the approved fabrication drawings including lugs. In case any such sectional weights are not available in the above documents, the manufacturer recommendation / BHEL Engineer instruction/Indian Standard Code recommendation shall be binding. BHEL reserves the right to reject any material not found satisfactory.
 24. **QUALITY PLAN:**
 1. The Quality Plan is a document, which presents in a tabular form the Quality control checks exercised by the vendor/its fabricator during the various stages of manufacture and dispatch in order to meet the requirements of this specification. This plan details, step by step, the operations, components and characteristics being controlled, method of exercising such controls, the importance (criticality) of the control (critical major or minor) with respect to the functioning of the item the extent to which the controls are exercised (100% samples, one per heat, etc.). Acceptance norms for the characteristics, method of maintaining records thereof as a proof of having exercised the control successfully, the agency responsible for performing and witnessing the checks and for verifying the records thereof.
 2. The bidders shall furnish the Quality Plan for approval from BHEL / NSPCL/ NTPC. In case the Standard Quality plans are included in tender specification, the bidder shall furnish his Quality Plan strictly in line with the same. Instructions for filling the Quality Plan format are given on the back of the format.
 3. Copies of Bidder's/Bidder's Collaborators catalogues/drawings/standards/specifications/ procedures etc. as mentioned in reference document of the Quality Plan shall be furnished for approval.
 4. In the Quality Plan, the bidder shall give in detail, the quality control checks exercised by him during the various stages of fabrication / manufacture such as:
 - a) All bought out items and incoming material checks carried out at sources and on receipt.
 - b) Process of manufacture i.e. welding, heat treatment etc.
-

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

- c) Manufacture of various components, sub-assemblies and assembly.
- d) Final Inspection and Testing including Performance Test at shop.
- e) Surface preparation and painting.
- f) Packing, Marking and Dispatch.

25. Inspection Agency: Inspection of packages shall be carried out by agency as per below Inspection category of packages:

- 1. Cat I: - Inspection shall be done jointly by NSPCL/ NTPC, BHEL & Successful bidder.
- 2. Cat-II: - Inspection shall be done by BHEL & Successful bidder.
- 3. Cat-III: - Inspection shall be done by BHEL & Successful bidder. In case if BHEL desires to waive off the inspection requirement- Fabricator shall provide the Certificate of conformance adhering to the quality parameters set thereon.

Please note, BHEL reserve the right to carry inspection by themselves or through nominated third party. For Inspection agency for various items, vendor may refer to Quality Plan.

26. Material Dispatch Clearance Certificate (MDCC)

- 1. When the tests have been satisfactorily completed at the Fabricator's works, the Inspection Agency shall issue a certificate to that effect within fifteen (15) days after completion of tests, but if the tests were not witnessed by the Inspection Agency or his representative, the certificate would be issued within fifteen (15) days of the receipt of the test certificates by the Inspection Agency.
- 2. BHEL / NTPC/NSPCL will issue MDCC to the Fabricator based on the QS Note/Report from the Inspection Agency.
- 3. Fabricator shall not dispatch any material before issue of MDCC by BHEL / NTPC/NSPCL.
- 4. The satisfactory completion of these tests or the issue of MDCC, shall not bind BHEL / NTPC to accept the supply/equipment, should it, on further tests after erection, be found not to comply with the contract provisions.
- 5. For Cat-I item, MDCC shall be issued by NTPC/NSPCL and it's the responsibility of vendor to arrange MDCC from them, and original MDCC shall be attached with Invoice by Vendor for claiming payment from BHEL.
- 6. For Cat-II & Cat-III items, MDCC shall be issued by NTPC /BHEL, which shall be valid for vendor payment.

27. GENERAL INSTRUCTION FOR DISPATCH:

- 1. No equipment / material shall be dispatched without prior consent of BHEL / NTPC/NSPCL. Vendor shall dispatch the equipment / material only after receipt of "Quality Surveillance Note" and Material Dispatch Clearance Certificate (MDCC) issued by BHEL / NTPC/NSPCL.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

2. Vendor shall notify in writing to site at least within 15 days in advance of shipment, the probable date, when the equipment / material shall be ready for dispatch.
3. Immediately after the shipment is made, necessary shipping / transport documents shall be sent by the vendor in accordance with the instructions of BHEL. The shipping documents / transport documents shall comprise of the following:
 - a) Bill of lading/ Railway Receipt / Lorry Receipt as applicable
 - b) Freight invoice
 - c) FOR Invoice
 - d) Packing List (No of copies as required)
 - e) Certificate of origin
 - f) Letter to Insurers
 - g) Quality Surveillance Note
4. The distribution procedure for the above documents shall be as per the “dispatch instructions”.

Bill to and Ship to (Consignee Address)

BHEL Site Office,
Construction Manager
2x250 MW, NSPCL Bhilai Expansion Power Project,
Bhilai, Dist: Durg, Chhattisgarh
Pin-490021
GST No.: 22AAACB4146P1ZP

Note:

1. Consignee address in LR should be strictly as per above.
2. Seller / Fabricator to note that to effect “Sale in Transit”, BHEL shall issue “Delivery Note” to the Transporter for transferring the ownership from BHEL to customer (NTPC).
3. Delivery note shall be carried by transporter along with other dispatch documents.

2.19 WET STACK FLOW MODEL STUDY & DESIGN OF THE CONDENSATE COLLECTION SYSTEM AND SUPPLY & INSTALLATION OF CHIMNEY LINING MATERIAL:

1. The contractor shall obtain approval of agency for conducting wet stack flow model study & design of the condensate collection system and supply of chimney lining material in line with technical specifications.
2. Contractor or its agency shall obtain approval of wet stack flow model study & design of the condensate collection system from BHEL/NTPC/NSPCL
3. The Bidder or its agency (Foreign / Indigenous) shall dispatch chimney-lining materials only after issuance of Material Dispatch Clearance Certificate (MDCC) by BHEL. MDCC shall be issued by BHEL within one month of submission of Material Test Certificate.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

4. The material shall be stored/handled strictly as per manufacturer recommendations.
5. Installation of Chimney lining material shall be within the shelf life shall be under expert supervision of manufacturer.
6. The successful bidder shall arrange any special T&P required as per manufacturer recommendation without any extra cost implication to BHEL.
7. The bidder without any extra cost implication to BHEL shall arrange expert supervision as applicable during the installation of chimney lining system.

2.20 RECORD FOR MATERIALS CONSUMED:

The contractor shall maintain and furnish to the engineer the record of materials consumed in the works for each activity. The statement showing the theoretical vis-a-vis actual consumption of specified materials, such as cement, reinforcement steel, structural steel, grouting compound, paint etc. shall be enclosed along with the running bills submitted by the contractor. Contractor has to also furnish the test results of the materials used in the work as per IS specifications.

2.21 SITE DRAINAGE

All water including sub-soil water which may accumulate on the site during the progress of the works, including monsoon period shall be removed by the contractor from the site to the satisfaction of the engineer. All such expenditure on de-watering shall be deemed to be included in quoted rates.

2.22 INSPECTION AND STAGE APPROVAL OF THE WORK :

The owner or his duly authorised representative shall have at all reasonable times access to the contractor's premises or works and shall have the power to inspect drawings or any portion of the work, examine the materials and workmanship and shall have the authority to reject any work. This would be implemented through joint inspection by the representative of the owner and BHEL / third party appointed by BHEL and in the form of joint protocols without any extra claims and loss of time and amount. All work embracing more than one process shall be subject to examination and approval at each stage thereof and the contractor shall give due notice in writing to the engineer when each stage is ready. In default of such notice being received, the engineer shall be entitled to approve the quality and extent thereof at any time he may choose and in the event of any dispute, the decision of the engineer thereon shall be final and conclusive.

2.23 UNCOVERING AND MAKING GOOD:

The contractor shall uncover any part of the works and/or make openings in or through the same as the engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the engineer. If any such part has been covered up or put out of view after being approved by the engineer and is subsequently found on uncovering to be executed in accordance with the contract, the expenses of uncovering and / or making opening in or through reinstating and making good the same shall be borne by BHEL. In any other case all such expenses shall be borne by the contractor.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

2.24 GATE PASS:

- THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS OF GATE PASS FOR HIS VEHICLE, T&P ETC. AS PRESCRIBED AND INSTRUCTED BY THE NSPCL /CISF AT HIS OWN COST, EACH GATE PASS HAS TO BE ENDORSED BY THE NSPCL / CISF BEFORE THE PASS BE USED. IN CASE OF TERMINATION OF THE SERVICE OF ANY OF T&P OR VEHICLE DURING THE CONTRACTUAL PERIOD, THE CONTRACTOR SHALL HAVE TO SURRENDER THE GATE PASS TO THE NSPCL/CISF AT THE END OF THE PROJECT ALL THE GATE PASSES ENDORSED BY THE NSPCL/ CISF FOR USE OF THE CONTRACTOR'S VEHICLE, T&P SHALL HAVE TO BE RETURNED.
- VALID RC BOOK, INSURANCE, FITNESS CERTIFICATE, ROAD TAX CERTIFICATE, PUC, DRIVING LICENSE, ETC. IS REQUIRED FOR GATE PASS FORMALITIES OF ALL VEHICLES. GOODS CARRYING CERTIFICATE IS ALSO REQUIRED FOR GOODS CATEGORY VEHICLES. GATE PASS FORMALITIES MAY TAKE TIME, SO CONTRACTOR HAS TO PLAN WELL IN ADVANCE ACCORDINGLY.
- THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS OF GATE PASS FOR HIS EMPLOYEES / WORKERS AS PRESCRIBED AND INSTRUCTED BY THE NSPCL /CISF AT HIS OWN COST, EACH GATE PASS HAS TO BE ENDORSED BY THE NSPCL / CISF BEFORE THE PASS BE USED. IN CASE OF TERMINATION OF THE SERVICE OF ANY OF HIS EMPLOYEE DURING THE CONTRACTUAL PERIOD, THE CONTRACTOR SHALL HAVE TO SURRENDER THE GATE PASS ISSUED TO THE EMPLOYEES TO THE NSPCL / CISF. AT THE END OF THE PROJECT ALL THE GATE PASSES ENDORSED BY THE NSPCL / CISF FOR USE OF THE CONTRACTOR'S EMPLOYEES SHALL HAVE TO BE RETURNED.
- POLICE VERIFICATION AND MEDICAL FITNESS CERTIFICATE OF ALL WORKERS / EMPLOYEES OF AGENCIES IS MUST FOR GATE PASS FORMALITIES. CONTRACTOR HAS TO ARRANGE THE SAME AT HIS OWN COST. GATE PASS FORMALITIES MAY TAKE TIME, SO CONTRACTOR HAS TO PLAN WELL IN ADVANCE ACCORDINGLY.

2.25 SAFETY

- BIDDER MUST VISIT SITE AND GET ACQUAINTED HIMSELF WITH WORKING CONDITION, SAFETY & OTHER FORMALITIES / PROCEDURE PREVAILING IN ONGC PREMISES. NO CLAIM SHALL BE ENTERTAINED ON ACCOUNT OF THIS.
- PPES IS MUST FOR ALL WORKERS AND STAFFS AT THE TIME OF INDUCTION ITSELF. CONTRACTOR HAS TO ARRANGE ALL THESE FOR THEIR WORKER AND STAFFS AT THEIR OWN COST.
- BIDDER TO NOTE THAT IN ADDITION TO BHEL REQUIREMENTS OF SAFETY, OCCUPATIONAL HEALTH AND ENVIRONMENTAL MANAGEMENT, CONTRACTOR SHALL STRICTLY FOLLOW & ABIDE THE SAFETY LAWS/RULES & REGULATION REQUIREMENTS OF NSPCL/NTPC AT SITE AND IN THE EVENT OF ANY DEVIATION/ DISPUTE, THE REQUIREMENTS OF NSPCL/NTPC IN THIS REGARD SHALL SUPERSEDE THE BHEL REQUIREMENTS. CONTRACTOR SHALL ARRANGE THE REQUIRED SAFETY FACILITIES AS MENTIONED IN THE BHEL HSE AND NSPCL/NTPC SPECIFICATION DOCUMENT.
- FOR NON-COMPLIANCES/VIOLATION OF SAFETY RULES AND FINE/PENALTY IMPOSED BY NSPCL AS THEIR RULES & REGULATIONS SHALL BE TO THE ACCOUNT OF CONTRACTOR & SAME SHALL BE PAID BY CONTRACTOR. IN EVEN OF ANY RECOVERY FROM BHEL BILLS BY CUSTOMER ON ACCOUNT OF CONTRACTOR AGAINST SUCH FINE/PENALTY, BHEL SHALL RECOVER SUCH AMOUNT/PAYMENT IN ADDITION TO DEPARTMENTAL OVERHEADS FROM ANY

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

AVAILABLE BILLS/PAYMENTS OF CONTRACTOR WHICH IS DUE FOR PAYMENT FROM BHEL.

2.26 **EXECUTION OF WORK**

The work shall be executed in a workman like manner and to the entire satisfaction of the engineer and as per technical specification issued with tender, IS codes, CPWD specifications as applicable. In case of conflict, the decision of the engineer shall be final and binding. The engineer will communicate or confirm his instructions to the contractor in respect of the execution of the work in a "Work Site Order Book" maintained at his office and the contractor shall visit this office daily and shall confirm receipt of such instructions by signing the relevant entries in this book. Such entries will rank as order or notices in writing within the intent and meaning of these conditions. Only BHEL approved make of electrodes will be used. All electrodes shall be heated and dried in the electric electrode drying oven to the required temperature for the period specified by the engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to site will have valid manufacturing test certificates. The test certificate will have co-relation with the lot no. / batch no. given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying over will be also calibrated and test certificate from Govt. approved/accredited test house traceable to National / International standards will be submitted to BHEL before putting the over in use. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates.

2.27 **PROTECTION OF WORK**

The contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the engineer for the protection of the works or for the safety and convenience of those employed on the works or the public. The contractor shall have total responsibility for protecting his works till it is finally taken over by the engineer. No claim will be entertained by the engineer for any damage or loss to the contractor's works and the contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the specifications and drawings. Should any such damage to the contractor's works occur because of other party not under his supervision or control, the contractor shall make his claim directly with the party concerned. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes.

2.28 **PROTECTION OF EMBEDMENTS, BOLTS ETC**

The contractor shall ensure proper protection to the satisfaction of the engineer, of all bolts, inserts, embedment etc. from weather etc. by greasing, rapping them with gunny bags or canvas or by any other means as directed by engineer. Cost of such protections shall be deemed to be included in the rates quoted for the item. Contractor has to clear the site/area where mechanical and electrical erection work is to be commenced or in progress. The contractor shall remove construction materials and equipment lying in

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

the vicinity and causing obstruction in the erection work within 24 hrs. notice. In case, he fails to clear the site, this will be done at his risk and cost by BHEL.

2.29 **COMPLETION OF WORK**

The works shall be completed to the entire satisfaction of the engineer and in accordance with the completion schedule as specified in the contract and all unused stores and materials, tools, plant, equipment, temporary buildings, site office, labour hutments and other things shall be removed and the site and work cleared of rubbish and all waste materials and delivered up clean and tidy to the satisfaction of the engineer at the contractor's expenses. BHEL shall have power to take over from the contractor from time to time such sections of the work as have been completed to the satisfaction of the engineer. Such work however shall not be treated as have been completed until the extra works are executed to the satisfaction of engineer. The guarantee period shall commence only after handing over of the entire works. The engineer shall certify to the contractor the date on which the work is completed and the date thereof.

2.30 **HIERARCHY**

In case of any conflict/deviations amongst various documents, the order of precedence shall be as follows

- 1) Statutory Regulations
- 2) NTPC Technical specification/Section C Technical specifications.
- 3) Scope of works as per Section A of the bid documents.
- 4) IS standards
- 5) BHEL's standard specification (Section D).

The above hierarchy shall be followed strictly for technical requirements only to carry out works under the scope of this contract.

2.31 **SITE CLEARANCE**

- i. **Site Clearance in Course of Performance:** In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.
- ii. **Clearance of Site after Completion:** After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities clean and safe.
- iii. **Disposal of Scrap:** "The Contractor shall with the agreement of the BHEL/ Employer promptly remove from the site any 'Scrap' generated during performance of any activities at site in pursuance of the Contract. The term 'Scrap' shall refer to scrap / waste / remnants arising out of the fabrication of structural steel work. The ownership of such Scrap shall vest with the Contractor except in cases where the items have been issued by the BHEL/ Employer from its stores for their installation only without any adjustment to the Contract Price. The removal of scrap shall be subject to the Contractor producing the necessary clearance from the relevant authorities (Custom,

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works and Technical Specifications

Excise etc.), if required by the law, in respect of disposal of the scrap. The liability for the payment of the applicable taxes/duties shall be that of the Contractor. The Contractor shall also indemnify to keep the Employer harmless from any act of omission or negligence on the part of the Contractor in following the statutory requirements with regard to removal/disposal of scrap. ~~The Indemnity Bond shall be furnished by Contractor as per proforma enclosed in Section-VII (Forms and Procedure ref FORM 18 COMMERCIAL BID DOCUMENTS PAGE 1142-1143).~~ Further, in case the laws require the Employer to take prior permission of the relevant Authorities before handing over the scrap to the Contractor, the same shall be obtained by the Contractor on behalf of the BHEL/Employer".

2.32 **DRAWING AND DOCUMENT**

The design/detailed drawings and documents shall be prepared by the successful contractor as per the specification, system requirement and the scope. These drawings and documents shall be submitted to BHEL/Customer/Customer's consultant for checking and approval. Approved drawings shall be released for construction. The contractor will also ensure availability of all drawings/documents at work place. Contractor shall ensure safe storage and quick retrieval of these documents. The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by BHEL engineer. Contractor shall ensure use of pertinent drawings / detail documents and removal of obsolete ones from work place. The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work. Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor. Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension / details, without specific approval of BHEL.

Bidders are requested to specifically note the following:

*Bidders are requested to have **pre-bid visit/ inspection of site** to make them fully acquainted with the site situation & nature of job. No claim shall be entertained at later date on account of non-familiarization of site conditions. Bidders may fix up their site visit in consultation with below mentioned contact person:*

Sh. Abhay Kumar Construction Manager BHEL Site Office: 2x2500 MW NSPCL Bhilai Mob No.: 8989997208	Sh. Paritosh Kumar PSWR Nagpur Ph no: 9717888794
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - III: Facilities in the scope of Contractor/BHEL (Scope Matrix)

Sl.No	Description	Scope		Remarks
		BHEL	Bidder	
	PART I			
3.1	<i>Establishment</i>			
3.1.1	<i>For Construction Purpose:</i>			
A	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
B	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
C	Construction of bidder's office, canteen and open /closed storage facilities including supply of materials and other services		Yes	
D	Bidder's all office equipments, office / store / canteen consumables		Yes	
E	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
F	Fire fighting equipments like buckets, extinguishers etc		Yes	
G	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	<i>For living purpose of the bidder</i>			
A	Open space for labour colony (as per availability)		Yes	Contractor has to make his own arrangements for shelter and transportation of labours as per requirement.
B	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	<i>ELECTRICITY</i>			
3.2.1	<i>Electricity for construction purposes 3 Phase 415/440 V</i>			CHARGEABLE
A	Single point source	Yes		CHARGEABLE. At two locations. Further distribution and Metering is in scope of bidder. Refer clause 2.6

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - III: Facilities in the scope of Contractor/BHEL (Scope Matrix)

Sl.No	Description	Scope		Remarks
		BHEL	Bidder	
PART I				
B	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
C	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	Electricity for office, stores, canteen etc of the bidder.			
A	Single point source	yes		Chargeable. Contractor Has to make his own arrangements from point source as per 3.2.1.A
B	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
C	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc			Contractor Has to make his own arrangements
A	Single point source		Yes	
B	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
C	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	WATER SUPPLY			
3.3.1	For construction purposes: (to be specified whether chargeable or free)			
A	Making the water available at single point		yes	Contractor has to make his own arrangement.
B	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	Water supply for bidder's office, stores, canteen etc.			
A	Making the water available at single point		yes	
B	Further distribution as per the requirement of work including supply of materials and execution		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - III: Facilities in the scope of Contractor/BHEL (Scope Matrix)

Sl.No	Description PART I	Scope		Remarks
		BHEL	Bidder	
3.3.3	Water supply for Living Purpose			Contractor has to make his own arrangement.
A	Making the water available at single point		Yes	
B	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4.0	LIGHTING			
A	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
B	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	
C	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
D	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	Communication facilities for site operations of the bidder			
A	Téléphone, fax, internet, intranet, e-mail etc		Yes	
3.6.0	Compressed air wherever required for the work		Yes	
3.7.0	Demobilization of all the above facilities		YES	
3.8.0	Transportation			
A	For site personnel of the bidder		Yes	
B	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - III: Facilities in the scope of Contractor/BHEL (Scope Matrix)

Sl.No	Description PART II 3.9.0 Erection Facilities	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.9.1	Engineering works for construction:		Yes	In consultation with BHEL/NSPCL/NTPC
A	Providing the erection/constructions drawings for all the equipment covered under this scope		Yes	
B	Drawings for construction methods		Yes	Preparation, submission and obtaining approval from BHEL/NTPC/NSPCL
C	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site		Yes	Changes are to be marked in drawing & handover to BHEL on completion of work.
D	Shipping lists etc for reference and planning the activities		yes	
E	Preparation of site erection schedules and other input requirements		Yes	In consultation with BHEL
F	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
G	Weekly erection schedules based on Sl No. E		Yes	In consultation with BHEL
H	Daily erection / work plan based on Sl No. G		Yes	In consultation with BHEL
I	Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - III: Facilities in the scope of Contractor/BHEL (Scope Matrix)

Sl.No	Description PART II 3.9.0 Erection Facilities	Scope / to be taken care by		Remarks
		BHEL	Bidder	
J	INSURANCE	YES	YES	<p>BHEL shall arrange for insuring the materials of BHEL / its customer covering the risks during transit, storage, erection and commissioning.</p> <p>Contractor shall take the insurance for their labours, tools, tackles, equipment etc.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - IV: T&Ps and MMEs to be deployed by Contractor

4.1 TOOL & PLANTS:

Nos of T&Ps to be deployed at site shall be decided w.r.t. monthly plan and review based on site requirement. Below given Nos are suggestive/tentative for planning purposes by the bidder.

A	For General Civil & Structural works	
Sl No.	Description of T&P	Quantity
1.	Concrete batching plant (30 Cum/Hr.)	02Nos
2.	ROTARY HYDRAULIC PILING RIGS WITH HANDLING CRANE	04 Nos
3.	Concrete Pump (45/60 Cum/Hr min capacity & lift 50M)	01 No
4.	Concrete Transit Mixer	04 Nos
5.	Concrete Boom placer	01No
6.	SLUDGE / SLURRY PUMP (DIESEL / ELEC)	As per requirement.
7.	Electrical Winch (of required capacity)	As per requirement
8.	Vibrators(electrical/diesel)	10 Nos
9.	Air Compressor/Air blower	01 No.
10.	Concrete breaker (HILTI/STANLEY or equivalent)	01 No.
11.	Welding Machine	As per requirement
12.	Self-priming Dewatering pump of various capacity (Diesel/Electric) From 2 HP to 7.5 HP	As per requirement
13.	Curing / dewatering pump – 1.5 / 2 HP	04 Nos
14.	Hydraulic Excavator /Poclain	02 Nos
15.	JCB	02 Nos
16.	<ul style="list-style-type: none"> Ply Shuttering board with adequate supporting structure – (Old steel shuttering plates will not be allowed). Steel shuttering (fare face) 	Lot (As per requirement)
17.	Mobile crane/ Farana (12/14/18 MT Capacity)	02Nos
18.	Trailer (20MT Capacity)	01 No
19.	Tractor mounted grader/ loader	As per requirement.
20.	Pipe Scaffolding, Clamps / Swivel Couplers (One/Two Way), Props, Jacks, Screw Heads, MS Pipes, Wooden Battens, Planks, Bullies, H Frames, Tie Rods with Nuts, Adjustable Achro Span (Considering Individual Areas)	As per requirement.
21.	Dumper	06 Nos
22.	Reinforcement bending machine	03 Nos
23.	Reinforcement cutting machine	03 Nos
24.	MS scaffolding pipe with matching Couplers	As per requirement
25.	Plate compactor	As per requirement

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - IV: T&Ps and MMEs to be deployed by Contractor

26.	Earth Compactor	As per requirement
27.	Vacuum Dewatering machine	As per requirement
28.	Total Station	01 No
29.	Auto level & staff	02 Nos
30.	Vibro roller of suitable capacity	To be mobilized as per site requirement
31.	Water Tanker	03 Nos
32.	100MT capacity crane	01 No
33.	75MT capacity crane	01 No
34.	40MT capacity crane	01 No
35.	Underground cable locator	01 No
36.	All equipments for area lighting like halogen bulbs and Portable light towers etc.	As per requirement
37.	All equipment required to install temporary MS Casing of 12 m or required length & suitable capacity crane etc.	As per requirement
38.	DG Set 125 KVA	As per requirement
39.	COMPUTER with printing/photocopy & CD writing facility	As per requirement
B	Additional requirement for Chimney	
1	Multistage high lift water pump (for curing) (lifting height 150 meters).	03 Nos
2	Tyre mounted crane 75MT (for fabrication and erection of flue cans)	01 Nos
3	Slip form shuttering & necessary spare parts	2 SET

FIELD QUALITY LAB EQUIPMENTS AS PER LIST ENCLOSED WITH THIS TENDER DOCUMENTS AS APPLICABLE FOR THE SCOPE OF WORK OF THIS TENDER

4.2 MEASURING AND MONITORING DEVICES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

4.3 COMPUTER INFRASTRUCTURE

The successful bidder(s) will have to establish computerized project management system along with one no supervisor with sufficient computer knowledge (knowledge of MS office) and the following are the minimum requirements of the system:

4.3.1 The bidder will have to install 2 nos PCs (multimedia PC work station Pentium-Duo, 1 GHZ or above, 320 GB HDD, 2 GB RAM, 100 MBPS LAN card of HCL/ COMPAQ/ ZENITH or equivalent make with window 8 O/S with required accessories like mouse, keyboard, UPS and required software like MS Office 2010 Professional, AutoCAD 2011, ADOBE PDF CREATOR (ver 8.0) with one no

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - IV: T&Ps and MMEs to be deployed by Contractor

laser jet printer compatible for A4 and A3 size printing (ink/ cartridge for which to be supplied as and when required, (the consumption may be assumed as 1 cartridge per month) with power backup at places, as per instruction of BHEL for exclusive use of BHEL.

- 4.3.2** These computers/ printers along with technical supervisor (two nos) shall remain contractor's property/ownership for all legal/technical purposes; however, contractor shall be allowed to take out/release the same after completion of the site works. **Further, the computer/printer along with two nos technical supervisor shall remain/work at BHEL offices.**
- 4.3.3** The contractor's technical supervisor shall provide data / information etc in prescribed formats for periodical updating of the progress reports, Billing, daily progress report, updating of schedule pertaining to the contractor's scope of work etc.
- 4.3.4** This facility has to be provided from 1st month from LOA date till completion of site works or as decided by BHEL. If contractor fails to provide computer/ printer as per requirement, for a continuous period of fifteen days or more, BHEL shall have the right to purchase it at risk and cost of bidder.
- 4.3.5** In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder, the bidder will be reimbursed at Rs 8000.00 per month for two computers with printer facility, if the services of computer and printer are being used by BHEL.

NOTE:

8. This above list is only indicative and neither exhaustive nor limiting. Quantities indicated above are only tentative. Contractor shall deploy all necessary T&P to meet the schedules & as prescribed by BHEL engineer and required for completion of work. In the event of non-mobilisation of any T&P by the successful bidder and as a result progress of work suffered, BHEL reserves the right to deduct suitable amount from the dues of the bidder, with assigning reasons thereof.
9. The contractor should also submit the fitness/calibration certificate for T&Ps regularly and renew as per applicable IS standards and statutory requirements. The tools & tackles shall not be removed from site without written permission of BHEL.
10. All distribution boards, connecting cables/welding cables, wire ropes, hoses etc., including temporary air/water/electrical connectors etc. shall have to be arranged by the contractor at his own cost.
11. The contractor shall engage trained and experienced operators for the operation of T&P's and machinery. BHEL engineer will check their skill and performance before they are allowed to operate the same. However, checking of skills by BHEL does not absolve the contractor of his responsibilities for proper and safe handling of equipment, consistent good performance of operators and regular performance evaluation of operators.
12. The day to day and routine maintenance of T&Ps and machinery should be carried out by contractor and these shall be maintained in good working condition during the entire period of use T&Ps in defective/damaged condition shall be rectified promptly

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - IV: T&Ps and MMEs to be deployed by Contractor

- to the full satisfaction of BHEL engineer. Contractor shall maintain records for maintenance of major T&Ps which shall be made available for inspection whenever required. In case of any lapses on the part of the contractor, BHEL at its own discretion get the servicing/repair of equipment done at the risk and cost of the contractor with BHEL overheads as applicable time to time.
13. The contractor shall arrange all spares needed for upkeep of all T&Ps and machinery. For cranes, contractor shall arrange spares for repair/replacement of filter, batteries, self, dynamo, gaskets, hoses, oil seals and rubber parts.
 14. The contractor shall permanently deploy with them minimum number of mechanics and skilled workers for undertaking the regular maintenance of tools and plants and machinery and for increasing / shortening of the crane boom as required. The contractor shall also arrange required tools, supports, consumables, illumination etc. for the above purpose.
 15. The contractor shall arrange for consolidation of ground and arrangement of sleepers/sand bag filling etc. for safe operation / movement of equipment including cranes/trailers etc. at his cost.
 16. In the event of BHEL arranging T&P's and Machineries at the cost and risk of contractor, any loss / damage to any part of T&Ps and machineries provided by BHEL shall be to the contractor's account and any expenditure on these accounts by BHEL will be recovered from the contractor's bill in case the contractor fails to make good the loss.
 17. Contractor shall ensure deployment of serviced and healthy T&Ps including cranes, lifting tackles, wire ropes, manila ropes, winches and slings etc. History card and maintenance records for major T&Ps will be maintained by the contractor and will be made available to BHEL engineer for inspection as and when required. Identification for such T&Ps will be done as per BHEL Engineer's advice.
 18. Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection Measuring and Test Equipment). The IMTEs shall have test/calibration certificates from authorized / Govt. approved / accredited agencies traceable to National/ International standards. Each IMTE shall have a label indicating calibration status Le., date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL engineer for control.
 19. Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. Also if any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e., repeat the readings taken by that instrument, failing which BHEL may deploy IMTEs and retake the readings at contractor's 'cost.
 20. BHEL shall have lien on all T&P, IMTEs and other equipment of the contractor brought to the site for the purpose of erection, testing and commissioning. BHEL shall continue to hold the lien on all such items through out the period of contract. No material brought to the site shall be removed from the site by the contractor and/or his subcontractors without the prior written approval of the engineer.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - IV: T&Ps and MMEs to be deployed by Contractor

21. The contractor shall submit month wise T&P deployment plan. It is only to assess the capability as well as understanding of the contractor to execute the work. However it shall be the contractor's responsibility to deploy the required T&Ps, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – V: T&Ps AND MME TO BE DEPLOYED BY BHEL ON
SHARING BASIS

5.1 BHEL WILL NOT PROVIDE ANY T&P's FOR THIS WORK

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

6.0 Time Schedule and Mobilization:

6.1 Initial Mobilization and Time Schedule:

After issuance of LOA (through email/fax/courier), Contractor shall report to the Construction Manager of BHEL at site or Project Manager of BHEL at HQ Nagpur within 15 days and make KOM (Kick of Meeting) for mobilization of manpower, T&P, Date of start of work and detailed completion program.

The contractor has to subsequently augment his resources in such a manner that the entire works are completed within the **contract period of (20) Twenty months from date of start of work** in a manner required by BHEL to match with the project schedule.

Date of start (DOS) of works shall be reckoned as 15 days from issuance of LOA.

6.2 Contract Period and Schedule of Completion:

The entire work under the scope of this contract shall be carried out in such a manner that the following listed major milestones are achieved as per completion schedule given against each activity & released for erection by other agency.

Sl No.	Completion Civil work of following Activity/facilities	Period from DOS
1	Raft of Chimney for Unit#1	End of 6 th Month
2	Absorber Foundation for Unit#1	End of 7 th Month
3	Raft of Chimney for Unit#2	End of 9 th Month
4	Absorber Foundation for Unit#2	End of 9 th Month
5	Foundation for Booster fans for Unit#1	End of 10 th Month
6	Compressor house building – release of front for equipment erection	End of 10 th Month
7	ECW pump house building- release of front for equipment erection	End of 10 th Month
8	Foundation for Booster fans for Unit#1	End of 13 th Month
9	Gypsum Dewatering building- release of front for equipment erection	End of 12 th Month
10	Ball mill building- release of front for equipment erection	End of 13 th Month
11	FGD Control room building- release of front for equipment erection	End of 13 th Month
12	Crusher House - release of front for equipment erection	End of 13 th Month

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

Sl No.	Completion Civil work of following Activity/facilities	Period from DOS
13	Lime Stone storage silo- release of front for equipment erection	End of 13 th Month
14	Completion of RCC Shell of Chimney for Unit#1	End of 12 th Month
15	Completion of Erection of structural platforms and flu cans for Unit#1	End of 13 th Month
16	Completion of Chimney in all respect including installation of electrical items, elevator, lining etc for Unit#1	End of 14 th Month
17	Completion of RCC Shell of Chimney Unit#2	End of 15 th Month
18	Completion of Erection of structural platforms and flu cans for Unit#2	End of 16 th Month
19	Completion of Chimney in all respect including installation of electrical items, elevator, lining etc for Unit#2	End of 17 th Month
20	Completion of all equipment foundations including intermediate floors building/ facilities required for Unit#1 including common building/ facilities.	End of 14 th Month
21	Completion of all equipment foundations including intermediate floors of building/ facilities required for Unit#2.	End of 17 th Month
22	Completion of all balance civil works in all respect including road, drains, pavements etc	End of 20 th Month

6.3 PROVISION OF PENALTY IN CASE OF SLIPPAGE OF INTERMEDIATE MILESTONES:

In case of slippage of Two Major Intermediate Milestones, mentioned as M1 & M2 hereunder, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to F-14.

Milestones	Civil work of following Activity	Period from DOS
M1	Absorber foundation for Unit#1	End of 7 th Month
M2	Completion of Chimney in all respect including installation of electrical items, elevator, lining etc for Unit#2	End of 17 th Month

Notes:

- Common activities like Plant roads, drains, fencing, paving and other misc. works etc. shall be completed in Phase wise manner / Instruction of Engineer within the Contractual time.
- Contractor shall note that individual milestones as above shall be achieved as per schedule furnished above.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

- Successful bidder, on award of work, shall prepare, submit and obtain approval of L2 & L3 schedule, detailed PERT network to meet schedule furnished above before start of work.
- The clause 2.7.9.1 below is added under the heading “Rights of BHEL” of General Conditions of Contract Volume-IC GCC.
 - 2.7.9.1 Provision of Penalty in case of slippage of Intermediate Milestones:
 - i) Two major Intermediate Milestones are mentioned as M1 & M2 in Chapter VI: Time Schedule of Vol IA Technical Conditions of Contract.
 - ii) In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.
 - iii) In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value*, limited to maximum 2% of Executable Contract Value, will be withheld.
 - iv) In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value*, limited to maximum 3% of Executable Contract Value, will be withheld.
 - v) Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone.
 - vi) Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
 - vii) Final deduction towards LD (if applicable as per clause 2.7.9 above), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be.
 - viii) In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.

* Executable Contract Value - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CHAPTER VII – Terms of Payment

7.0 TERMS OF PAYMENT

The payments for works under the scope of this contract shall be as per clause no 2.6; clause 2.22; clause 2.23 of General Conditions of Contract and Chapter X of Special Conditions of Contract. However, Clause No. 10.5 on RA Bill Payments, in Volume-IB, Chapter-X of SCC, is revised as under:

7.1 Billing methodology:

Contractor shall prepare, submit and obtain approval from BHEL for Broad Billing Break-up and detailed billing break up. However, percentage contribution of Design & Engineering, Civil Works and Structural Works with respect to contract value shall be restricted to 1.43%, 62.30% and 36.27% respectively.

The contractor shall submit monthly running bill along with supporting documents on pro-rata basis as per the approved detailed billing break-up.

7.2 Progressive Payment against Design and engineering:

- 95% of design and engineering as per approved billing break up shall be paid progressively against release of RFC drawing to site for civil works and release of fabrication drawing for Structural works as per BHEL engineer certification.
- 5% of design and engineering as per approved billing break up shall be paid progressively against acceptance of as built drawings as per BHEL engineer certification.

Note: PVC shall not be applicable for design and engineering.

Further, the contract value for the purpose of PVC calculation under GCC clause 2.17.2 shall be exclusive of design and engineering charges.

7.3 Progressive Payment against Supply:

A. Supply of shop fabricated steel structures and Chimney lining material:

- a. 90% of basic price of material shall be paid progressively as per approved billing break up, along with freight, taxes and duties (as applicable) against receipt & acceptance of material at site and as per BHEL Engineer's certification.
- b. 10% of basic price of material shall be paid progressively as per approved billing break up, along with freight, taxes and duties (as applicable), against erection /installation (in case of chimney lining material) of material at site and as per BHEL Engineer's certification.

B. Supply of reinforcement steel (TMT/mild steel), Structural steel and cement (OPC/PPC):

- a. 70% of basic price of material shall be paid progressively as per approved billing break up, along with freight, taxes and duties (as applicable) against receipt & acceptance of material at site and as per BHEL Engineer's certification.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CHAPTER VII – Terms of Payment

- b. 30% of basic price of material shall be paid progressively as per approved billing break up, along with freight, taxes and duties (as applicable), paid against incorporation of material into works as per RFC drawings and BHEL Engineer's certification.

Note: Contractor to take prior approval of engineer in-charge before procurement & dispatch of reinforcement steel (TMT/mild steel), Structural steel and cement (OPC/PPC) to site:

7.3.1 Documents required for payment of supply are as under:

- GST Compliant Invoice (1 Original + 3 copies)
- PVC calculation and copy of all applicable indices.
- Original Inspection Reports (IRs) – with relevant painting/SB remarks - duly signed by BHEL/BHEL authorized QC inspector and Fabricator/supplier with seal (1 Original + 3 copies)- as applicable
- Copy of dispatch clearance from BHEL (NTPC/NSPCL MDCC, as applicable)
- LR copy (Consignee address must be BHEL NSPCL Bhilai FGD site, unless otherwise specified by BHEL authorities during execution of the contract).
- Bill of lading or AWB, if applicable.
- COO- Certificate of origin, if applicable.
- Packing list Indicating Quantity / Gross weight/Net Weight wherever applicable against each item dispatched.
- MRC (Material Receipt Certificate) signed by BHEL/site
- Material Test Certificate (For Raw Materials/Consumables)
- Copy of insurance intimation letter / e-mail. (Intimation to Insurance agency to be sent on the same day of dispatch)
- Guarantee certificates.
- Weighment slip certified by BHEL/site.
- BHEL engineer's certified reconciliation statement and utilization of reinforcement steel (TMT/mild steel), Structural steel & cement (OPC/PPC).
- Contractor shall submit any additional documents as desired by the customer.

Note: Payment for engineering clearances/approval of wet stack model flow study & wind tunnel study for wet stack/Chimney shall be included in payment for supply of chimney lining material and same shall not be paid separately.

7.4 Progressive Payment against Civil and structural Works.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CHAPTER VII – Terms of Payment

100% of civil and structural works other than paid under terms of payment clause 7.3 - Progressive Payment against Supply, shall be paid progressively as per approved billing break:

- a. Certification by the engineer in-charge for the quantum of work completed.
- b. Certification by the engineer in-charge/Owner's field quality surveillance representative for the successful completion of quality checkpoints involved in the quantum of work billed.

7.4.1 Documents required for payment are as under:

- The protocols for the work done in a month shall be submitted in triplicate duly agreed/signed by BHEL Engineer/customer.
- PVC calculation and copy of all applicable indices.
- All supporting documents including HR compliances, MRC (Material Receipt Certificate) for supplies, Quality documents, signed protocols for quantum of work completed & billed are to be submitted along with each running bills.
- Consumption report of reinforcement steel & cement shall be submitted along with each running bill.
- Contractor shall submit any additional documents as desired by the customer.

7.5 Note:

Payment for running bills shall be released normally within 30 days of submission of running bill complete in all respects with all supporting documents. It is the responsibility of the contractor to make his own arrangements for making timely payments towards labour wages, statutory payments, outstanding dues etc. and other dues in the meanwhile. Few points of consideration are as below:

- The RA bill payments are interim payments.
- Recoveries because of electricity, statutory deductions etc. shall be made as per terms of contract.
- BHEL will release payment through Electronic Fund Transfer (EFT)/RTGS.
- Final bill shall be submitted after completion of all works covered under this contract.
- Supplier invoices pertaining to all material procurement and material test certificate shall be submitted to BHEL for verification purpose.
- All statutory/ regulatory obligations including EXIM policies shall be complied by the successful bidder and supporting documents towards the same shall be submitted to BHEL by the successful bidder.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

CHAPTER VIII – TAXES & DUTIES

8.0 TAXES, DUTIES, LEVIES (Rev 13 dated 05/11/2018)

1. All taxes excluding GST, GST Cess & BOCW Cess **but including, Royalties, fees, license, deposits, commission, any State or Central Levy and other charges whatsoever, if any, shall be borne by you and shall not be payable extra.**
2. Any increase of the taxes excluding GST, GST Cess & BOCW Cess, at any stage during execution including extension of the contract shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. Please note that since GST on output will be paid by BHEL separately as enumerated below, your quoted rates/ price should be after considering the Input Credit under GST law at your end.
3. **GST :**
The successful bidder shall furnish proof of GST registration. GST along with Cess (as applicable) legally leviable & payable by the successful bidder as per GST Law, shall be paid by BHEL. Hence Bidder shall not include GST along with Cess (as applicable) in their quoted price.
4. GST charged in the Tax Invoice/Debit note by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5. Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details will as below:-
BHEL GSTN – As per **Annexure -1**
NAME -- Bharat Heavy Electricals Limited
ADDRESS – Site address
6. Bidder to immediately intimate on the day of removal of Goods (in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice to below email ids to enable BHEL to meet its GST related compliances :-
Email id ---- to be intimated later on.

In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is not attributable to BHEL.
7. In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Rule 53.
8. Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from the vendor along with interest levied / leviable on BHEL, as the case may be.
9. Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law , GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the bidder along with interest levied / leviable on BHEL.
10. Waybill: Successful Bidder to arrange for waybill / e-waybill for any transfer of goods for the execution of the contract.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

CHAPTER VIII – TAXES & DUTIES

The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.

11. **New taxes and duties:-**Any New taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period including extension, if the same is not attributable to you, shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
Benefits and/or abolition of all existing taxes must be passed on to BHEL against new Taxes, if any, proposed to be introduced at a later date.

In case any new tax/levy/duty etc. becomes applicable after the date of bidder's offer but before opening of the price bid, the bidder must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of the price bids. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

12. For transportation work, bidder shall declare in his quotation whether he is registered under GST, if yes, whether he intends to claim GST on forward charge basis. In absence of this declaration, BHEL will proceed further with the assumption that bidder intends not to claim GST on forward charge basis. However, in case of GST registered transporter, the amount to the extent of goods and service tax will be retained till BHEL avails the credit of GST. Further, transporter shall issue tax invoice which inter alia includes gross weight of the consignment, name of the consigner and the consignee, registration number of vehicle in which the goods are transported, details of goods transported, details of place of origin and destination, GSTIN of the person liable for paying tax whether as consigner, consignee or goods transport agency, and also containing other information as mentioned under rule 46.
13. **TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished.**
14. **TDS under GST shall be deducted at prevailing rates on applicable value from the running bills.**
15. Refer Annexure – 2 for BOCW Act & Cess Act.

ANNEXURE-1

State wise GSTIN no.s of BHEL

Sl. No	Projects under state	GSTIN
1	Andhra Pradesh	37AAACB4146P7Z8
2	Bihar	10AAACB4146P1ZU
3	Chhattisgarh	22AAACB4146P1ZP
4	Gujarat	24AAACB4146P1ZL
5	Jharkhand	20AAACB4146P5ZP
6	Madhya Pradesh	23AAACB4146P1ZN
7	Maharashtra	27AAACB4146P1ZF
8	Orissa	21AAACB4146P1ZR
9	Telangana	36AAACB4146P1ZG

ANNEXURE-2

TECHNICAL CONDITIONS OF CONTRACT (TCC)

CHAPTER VIII – TAXES & DUTIES

BOCW Act & Cess Act

Bidder may please note that the sub-contractor/bidder of BHEL engaging building or construction worker in connection with building or other construction work, are required to follow the procedures enumerated below:

1. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
2. It shall be sole responsibility of the contractor engaging Building Workers in connection with the building or other construction works in the capacity of employer to apply and obtain registration certificate specifying the scope of work under the relevant provisions of the Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 from the appropriate Authorities.
3. It shall be responsibility of the contractor to furnish a copy of such Registration Certificate within a period of one month from the date of commencement of Work.
4. It is responsibility of the contractor to register under the Building and other Construction Workers' Welfare Cess Act, 1996 and deposit the required Cess for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 at such rate as the Central Government may , by notification in the Official Gazette, from time to time specify. However, before registering and deposit of Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, the contractor will seek written prior approval from the Construction Manager.
5. It shall be sole responsibility of the contractor as employer to get registered every Building Worker, who is between the age of 18 to 60 years of age and who has been engaged in any building or other construction work for not less than ninety days during the preceding twelve months as Beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996.
6. It shall be sole responsibility of the contractor as employer to maintain all the registers, records, notices and submit returns under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
7. It shall be sole responsibility of the contractor as employer to provide notice of poisoning or occupation notifiable diseases, to report of accident and dangerous occurrences to the concerned authorities under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the rules made thereunder and to make payment of all statutory payments & compensation under the Employees' Compensation Act, 1923.
8. It shall be the responsibility of the sub-contractor as employer to make payment/deposit of applicable cess amount on the extent of work involving building or construction workers engaged by the sub-contractor within a period of one month from the receipt of payment. It shall also be responsibility of the Contractor to furnish BHEL on monthly basis, Receipts/ Challans towards Deposit of the Cess under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder along with following statistics :

TECHNICAL CONDITIONS OF CONTRACT (TCC)

CHAPTER VIII – TAXES & DUTIES

- (i) Number of Building Workers employed during preceding one month.
 - (ii) Number of Building workers registered as Beneficiary during preceding one month.
 - (iii) Disbursement of Wages made to the Building Workers for preceding wage month.
 - (iv) Remittance of Contribution of Beneficiaries made during the preceding month
9. BHEL shall reimburse the contractor the Cess amount deposited for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. However, BHEL shall not reimburse the Fee paid towards the registration of establishment, fees paid towards registration of Beneficiaries and Contribution of Beneficiaries remitted.
10. It shall be responsibility of the Building Worker engaged by the Contractor and registered as a beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 to contribute to the Fund at such rate per mensem as may be specified by the State government by notification in the Official Gazette. Where such beneficiary authorizes the contractor being his employer to deduct his contribution from his monthly wages and to remit the same, the contractor shall remit such contribution to the Building and other construction Workers' Welfare Board in such manner as may be directed by the Board , within the fifteen days from such deduction.
11. Bidders may please note that though the quoted price is exclusive of BOCW (which will be reimbursed by BHEL as per sub-clause 9 above) , however, If at any point of time during the contract period, non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder is observed, BHEL reserves the right to deduct the applicable cess (1%) on the contract value and penalty (if any, imposed by Cess Authorities) from the payables on account of non-compliance.
12. The contractor shall declare to undertake any liability or claim arising out of employment of building workers and shall indemnify BHEL from all consequences / liabilities / penalties in case of non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CHAPTER XII – Manpower Requirement

TENTATIVE MANPOWER REQUIREMENTS:

- (a) **Project manager – 01** with adequate experience of minimum 10Years in Industrial Foundation, Building & Structural Works, Power Plant Civil & architectural Works.
 - (b) Experienced Civil Engineers – 04 heads
 - (c) Experienced Foreman / Supervisors – 06 heads
 - (d) Planning & Billing Engineer – 01 heads (**Min 2 heads including documentation**)
 - (e) Stores, Gate Pass – 01 heads
 - (f) Accounts & Administration- 02 head
 - (g) Quality Control Engineer/Chemist – 01 head (**min 2 head including one supervisor**)
 - (h) Safety Engineer (officer) – 01 head (**min 2 head including 1 safety supervisor**)
 - (i) Surveyor – 02 heads capable to handle total station
 - (j) Operator, Licensed Electrician, Mechanic - As per requirement
 - (k) Experienced Carpenters & Helpers – Lot for similar nature of work and as per requirement.
 - (l) Experienced Bar Benders & Helpers – Lot for similar nature of work and as per requirement.
 - (m) Security Guards (Round The Clock) – As per requirement
- 8.0 Deputation of man-power shall be jointly decided at site in line with construction schedule.
- 8.1 Engineer/ supervisor for other functions like store & purchase, material management, planning, finance, administration & liaison etc are to be provided as per site requirement and not considered above.
- 8.2 BHEL reserves the right to reject or approve the list of personnel proposed by the contractor. The persons whose bio-data have been approved by BHEL will have to be posted at site and deviation in this regard will not be permitted unless specific & reasonable justification is made.
- 8.3 In addition to above, a well experienced qualified engineer to be designated, as 'Project Co-coordinator', shall be deployed by the contractor. Such engineer shall have adequate exposure on the job and shall remain fully involved in all planning activities, guidance etc. to contractor's own team during the complete execution period of contract.
- 8.4 The month-wise manpower deployment plan to be submitted to BHEL and is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required manpower, for timely and successful completion of the job, to any extent over and above those indicated in

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CHAPTER XII – Manpower Requirement

the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account