



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

TCN – 02

Ref: PSER:SCT:KGN-C2141:TCN-02

Date: 21-03-2022

Sub	Tender Change Notice (TCN) - 02	
Job	Package-A: Civil, structural and architectural works for retrofitting of ESP for R&M 4X210 MW (U#1, 2, 3&4) Kahalgaon STPP, NTPC, Bhagalpur, Bihar.	
Ref	1.0	Tender no PSER:SCT:KGN-C2141:22
	2.0	BHEL's NIT, vide reference no. PSER:SCT:KGN-C2141:9030 Date: 04-03-2022.
	3.0	BHEL's TCN-01, vide reference no. PSER:SCT:KGN-C2141:TCN-01 Date: 16-03-2022.
	4.0	All other pertinent issues till date.

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

- 1.0 Revised Volume-IF-TCC-CML-Rev-1 is attached, superseding Volume-IF-TCC-CML-Rev-0 issued earlier along with NIT. Bidders are requested to go through entire volume before submitting their offer.
- 2.0 Revised 'No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.
- 3.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

DY. MGR (SCT)

Encl: As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960 फोन/Phone : बोर्ड/EPABX : 23211691, 23211798, 23211796

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
 Power Sector - Eastern Region,
 Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
 Kolkata – 700 091

Sub	No Deviation Certificate.	
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	4.0	BHEL's TCN-02, vide reference no. PSER:SCT:KGN-C2141:TCN-02 Date: 21-03-2022.
	5.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted/uploaded offer/documents in accordance with tender instructions with acceptance of the terms & conditions of the tender by us and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)

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This volume shall be construed as part of tender document and shall be read along-with others volumes of tender. Unless otherwise specified, in case of any conflict or inconsistency between the general and technical conditions, the same shall be brought out by the bidder in writing to BHEL for clarification during pre-bid discussions; failing which most stringent interpretation/ clause in favour of BHEL shall be adopted and the same shall be binding to the bidder. Unless otherwise specified, all terms & conditions shall be applicable for entire scope and for each package of the tender

1.0	PROJECT SYNOPSIS AND GENERAL INFORMATION
1.1	Kahalgaon Super Thermal Power Project has been set up by NTPC is located near Kahalgaon town in Bhagalpur district of Bihar State. The Stage-I, Phase-I of the Project shall comprise of four (4) units of 210 MW presently under commercial operation. LOCATION AND APPROACH The proposed work of the project is located at latitude and longitude 25°15' N and 87° 15' E respectively. The nearest railhead is Kahalgaon Railway Station of Eastern Railway is approximately 2.0 km away from the project site. The Bhagalpur-Sahibganj State Highway runs parallel to the railway track. Bhagalpur, the nearest major town, is about 30-km southwest of project site. The nearest commercial airport is Patna and located at a distance of approximately 250-km. Kahalgaon Railway station is 400 Km away from Howrah. Further to the information given in this sub-section, Bidders are also advised visit the project site and collect data on local site conditions.
2.0	SCOPE OF THE CONTRACT
2.1	The scope of works covers Civil, structural and architectural works for retrofitting of ESPs for ESP R & M 4X210 MW (U#1,2,3&4) Kahalgaon STPP, NTPC, Bhagalpur, Bihar.(Package-A) The scope covers providing labour, supervision, materials, T&Ps etc. for entire work as per specification and tender terms & conditions.The scope of work is indicative but not limited to the given below. Civil Works for Retrofitting of ESP and R &M Work of Unit 1, 2, 3 & 4 and Other Work Detailed Below: • Dismantling, demolishing of existing structure as required for foundation work for R &M Work for Unit 1 2, 3 & 4. • Pile, Pile Cap, Pedestal for one no additional ESP pass of Unit 1, 2, 3 & 4, Ash handling system, Ash silo, Utility Building & other building work. • Foundation for Ash Handling System from new ESP to Ash Silo / Ash slurry pump House • Modification / extension of ESP Control Room. • Silo & Silo utility Building • Modification and extension of civil work for Mill Reject system • Any Other Misc. Civil work required for R &M Work for Unit 1 2, 3 & 4. • Foundation for station transformer of each unit. • Wall opening and closing, cable trench if required. • Earthing pit and earthing on ground level. • Civil structural work for compressor house The Contractor shall carry out the above scope of works for the following areas as per directions of the BHEL-

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	Tentaive List of Balance work (civil ,structural & archtectural) Scope in PACKAGE A		
	Sr. No.	Name of buildings/structures	Scope
	1	Fly ash silo	Balance works like testing of piles, Pile caps, pedestals & back filling etc. as per instruction of BHEL
	2	Intermediate silo	Balance works like testing of piles, excavation,Pile caps, pedestals,column, beam & back filling etc. as per instruction of BHEL
	3	Silo utility building	Balance works like plinth beam, Column, roof beam and slab, lintel beam , crane girder, brick work , plaster, painting, door window supply and fixing etc. as per instruction of BHEL
	4	Backfilling of ESP unit 2E pass	Backfilling as per instruction of BHEL
	5	Compressor house	100 no. piles, testing of piles and all other balance works (like piles cap, pedestals, structural fabrication and erection works , column, beams, slabs etc.) as per instruction of BHEL
	6	Pipe and cable rack	Foundation and other works as per instruction of BHEL
2.2	Mix design(M 15, M 20, M 25 ,M 30, M 35/M 40) 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.		
2.3	The works to be performed under this contract consist of providing all labour, supervision, material, scaffolding, construction equipment, tools and plants, temporary works, supplies including POL, transportation and all incidental items not shown or specified but reasonably implied or necessary for the proper completion of work in all respects. Testing of all materials, concrete, earthwork other allied works, preparation of bar bending schedules on the basis of construction drawings, preparation of fabrication drawings etc. are included on the rates of items of work. Works shall only be carried out with approved structural fabrication drawings.		
2.4	The scope shall also include setting up by the bidder a testing laboratory (one AC lab size 4.5mtr x 6mtr and 1 non AC lab 4.5 mtr x 4.5 mtr.) in the field to carry out all relevant tests. Detail of laboratory equipment as per Annexure-A is to be arranged		

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	by the contractor within quoted rate. For conducting day to day quality assurance service, one no. chemist/Qualified quality engineer to be deployed as necessary.
2.5	All quality standards, tolerances, welding standards & other technical requirements shall be strictly adhered to. The Bidder shall fully apprise himself of the prevailing conditions at the proposed site, climatic conditions including monsoon pattern, soil conditions, local conditions and site specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may not have been specifically brought out in the specifications.
2.6	The area of work shall be cleared of all vegetation, rubbish and other objectionable matter and materials remove, shall be burnt or otherwise disposed of as directed by the Engineer-in-Charge. No separate payment for these operations shall be made. The cost of all these operations shall be deemed to have been included in the unit rates rendered for the different items under bill of quantities.
2.7	Unless specified otherwise elsewhere in the contract, the unit rates shall include all material, equipment, fixtures, labour construction plant, temporary works and everything whether of permanent or temporary nature necessary for the completion of job in all respects.
2.8	The unit rates for various items of B.O.Q shall include all the stipulations mentioned in technical specifications and nothing extra over B.O.Q rates shall be payable.
2.9	The bidder should fully apprise himself of the prevailing conditions at the proposed site, climatic conditions including monsoon pattern, local conditions, soil strata and site specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may have not been specifically brought out in the specifications.
3.0	SITE VISIT
3.1	Contractor should visit site and acquire full knowledge & information about site conditions prevailing at site and in and around the plant premises together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid. In line with the above, site visit confirmation will be required to be submitted by the bidder with the technical bid.
3.1	OPEN SPACE FOR OFFICE & STORAGE
3.1.1	Open spaces for material storage yard & construction of temporary site office may be allocated as made available by the customer / BHEL free. Contractor has to make his own arrangements for labour colony including Electricity and water for the labour colony.
3.1.2	Construction of necessary stores and storage of materials shall be in contractor's scope. BHEL shall provide available space as received from customer on mutually agreed basis. Security of stores & work place shall be in Contractor's scope.
3.1.3	REMOVAL OF TEMPORARY FACILITIES
	When the Work is completed all such temporary structures and facilities shall be removed from the Site and the area shall be restored to its original condition
3.2	WATER
3.2.1	BHEL will provide construction water at one point, as available from customer, approximately or within 300 m from work premises, free of cost to the contractor. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of water supply and the contractor shall claim no compensation for

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	delay in work for such interruption. Contractor may make standby arrangement for water for which no separate payment shall be made by BHEL.
3.2.2	Further necessary network for water system shall be done by the bidder at his own cost.
3.2.3	Contractor should arrange on their own, water in their labour colony.
3.2.4	Contractor will have to arrange for storage of water to meet the day-to-day requirement. Bidder will ensure adequate supply of construction water to meet the requirement of water during major concreting
3.2.5	The availability of water (construction as well as drinking) in Kahalgaon project may be limited. Contractor shall ensure that no water is wasted. In this regard the contractor shall take all necessary measure towards preservation of water.
3.3	ELECTRICITY
3.3.1	CONSTRUCTION POWER & GENERAL ILLUMINATION NET-WORK:- BHEL Shall Provide Construction Power free of charge at 415V level at one point (within 200 M from his work place / batching plant), bidder has to make his own distribution arrangement to draw electricity. Contractor may make standby arrangement for electricity for which no separate payment shall be made by BHEL. The bidder will have to procure & install adequate area illumination system during construction right from start of his work. This system will include temporary pole lighting, portable lighting towers with sufficient DG back-up for area lighting at different working areas for execution of the work & safety of workmen within the quoted rate. The illumination should be such that minimum illumination requirement as specified in specification or any-where for general illumination is maintained. 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 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 accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.
3.3.2	The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives / T&Ps are deployed.
3.3.3	The power supply will be from the available source of customer. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of power supply / variation in voltage level and no compensation for delay in work can be claimed by the contractor due to such non-supply on the grounds of idle labour, machinery or any other grounds.

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3.3.4	Bidder will have to arrange sufficient illumination at their own work areas.
3.3.5	The contractor should ensure that the work in critical areas is not held up in the event of power breakdown. In the event of breakdown in the electric supply, if the progress of work is hampered, it will be the responsibility of the contractor to step up the progress of work after restoration of electric supply so that overall progress of work is not affected.
3.3.6	The contractor shall have to make arrangement at their own cost for illumination that will be required in the working area for execution of the work & safety of workmen.
3.3.7	The contractor shall have to make arrangement at their own cost for illumination etc. in labor colony. However there may be provision of Chargeable Power for labor colony for which contractor has to install meters and necessary accessories
4.0	TOOLS & PLANTS
4.1	All the tools and plants required for execution of the above work are in contractor's scope.
5.0	MATERIAL HANDLING & BHEL ISSUED MATERIAL
5.1.1	Cement, Reinforcement Steel, Structural Steel & earthing rod as mentioned specifically in BOQ will be issued free of cost by BHEL(unless otherwise noted) for use in the work covered in this contract. Consignment of Cement , Reinforcement Steel, Structural Steel & earthing rod will be directly issued to the contractor as received by BHEL from its supplier, as per delivery challan of supplier.
5.1.2	Alternately, BHEL may also provide free issue Cement , Reinforcement Steel, Structural Steel & earthing rod to the contractor from BHEL / customer's store within the plant premises, on weighment basis. Receipt from BHEL / customer's stores, handling / transportation to work site, unloading etc will be under the scope of work within his quoted rate. The contractor shall in no case be entitled for any compensation or damages on account of any delay in supply or non-supply thereof for all or any such material.
5.1.3	Open land (Limited area free from encumbrance) as available from customer shall be provided by BHEL on free of cost basis. Contractor shall maintain one centralized fenced store cum bar bending yard & storage yard (Area approx 7500 Sqm). Hard surfacing of this yard and all round drain shall be carried out by the contractor at his own cost within the quoted rate. Bidder shall make complete arrangement of necessary security personnel, to safeguard all such materials in his custody. Materials issued will be used only for construction of permanent work. The contractor shall take care of material issued by BHEL and shall protect the same from theft, damage and weathering.
5.1.4	Excessive rusting of steel 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 recovered from the interim payment at the penal rate specified in the tender.

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5.1.5	The contractor shall construct waterproof cement store (capacity minimum 100 MT) for storing and stacking of cement. CGI / Metal Sheet roofing (slope) with brick masonry wall, PCC flooring. Materials required for the same shall be provided by contractor at his own cost. Cement has to be kept over wooden raised platform. Stacking of cement is to be done as per IS codes with proper illumination and locking arrangements.
5.1.6	Clotting of cement must be avoided. In case, due to any cause attributable to the contractor, such clotting of cement occur rendering the same unusable, then such quantity of cement shall be disposed immediately from the plant premises by the vendor.
5.1.7	No material shall be issued to the contractor except as those indicated above i.e., Cement, Reinforcement Steel, Structural Steel and earthing rod. Contractor will have to make his own arrangement at his own cost for procurement of any other material as required for the works from approved supplier or supplier duly approved by BHEL/Customer and of such quality as acceptable to BHEL/Customer.
5.1.8	The contractor shall maintain proper store account for all the BHEL issued materials and shall give copy of once in a months computerised reconciliation statement along with RA Bill for maintaining account for the BHEL issued material.
5.1.9	The contractor shall solely be responsible for the safety & quality of material after it is handed over and issued to contractor by BHEL.
5.1.10	Under any circumstances, BHEL issued materials shall not be taken out of the project site unless otherwise permitted by BHEL.
5.2	ISSUE OF MATERIALS The free issue steel,cement etc. those specifically mentioned in price schedule shall be issued to the successful bidder on the following basis.
5.2.1	ISSUE OF CEMENT
5.2.1.1	Cement as received from the manufacturer/ stockiest will be issued free of cost to the contractor. The cement shall be provided normally in bulkers and shall be unloaded in the silos (2 Nos cement silo of 100MT per 30CUM batching plant) to be installed by the bidder nearer to their batching plants. This is only minimum requirement and the No of cement silos shall be increased based on the site requirement. Unloading arrangements shall be provided by the bidder at his own cost including provision of necessary manpower support.
5.2.1.2	On advance request of the bidder, the cement shall be supplied in 50kg tamper proof sealed Bags for other than RCC works like masonry, flooring works etc. The theoretical weight of each bag of cement for issued purposes will be considered as

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	50 kg, the contractor shall be accountable for the cement issued to him on this notional weight only. No claim whatsoever will be entertained because of difference between theoretical and actual weight of the bags of cement. The empty cement bags duly accounted for against issue shall be in the custody of the contractor and the same shall be disposed by the contractor as per statutory regulation prevailing in the project. Proper storage area/ shed shall be constructed by successful bidder at his own cost
5.2.1.3	The contractor shall submit to the Engineer-in-charge, a statement indicating estimated quantity of cement required during a quarter, at least two months in advance of the quarter. In addition, the contractor shall also furnish the estimated requirement of cement during a month by the third week of the previous month indicating his requirement.
5.2.1.4	Bidder is responsible for unloading the cement as soon as the arrival of cement, either in silo, if received in bulker or in the weather proof cement storage sheds, if received bags. Bagged cement shall be stored in a weatherproof shed having dense impervious bituminous or concrete floors which shall be kept swept clean at all times. The storage arrangements (to be made by the contractor at his own cost) shall be fully completed and approved by the owner (BHEL/NTPC) before any cement is delivered to site. The construction of cement storage sheds as per the requirement of BHEL, unloading of cement bags, stacking properly in the storage sheds, removal of the sheds after the completion of the work is in the scope of bidder within the quoted price.
5.2.1.5	Bidder is responsible for sampling and testing of cement as per Indian Standard/Specification/approved quality plan in the testing laboratory established by the bidder.
5.2.1.6	Bidder is responsible for carrying out design mix as per IS 456/10262 Latest revision and specification, using the cement provided by BHEL and submit the design mix proportions for the approval of BHEL/NTPC. Coarse & fine aggregates to be used for design mix shall be from approved quarries/source and shall conform to relevant IS standard. Also, admixture of approved quality will only be used when directed or permitted by the Engineer. The different types of admixtures which may be necessary to satisfy the concrete mix and the design requirement shall conform to relevant IS Standard. The design/trial mix shall be carried out time to time on change of brand/type of cement supplied by BHEL and suitable adjustments on the quantity of ingredients (fine aggregates, coarse aggregates, admixture) of the concrete to get the required workability and durability, shall be the responsibility of the bidder without any extra cost to BHEL. Fine and coarse aggregated to be used in concreting shall be from same source/quarries which has been approved at the time of finalisation design mix. Admixture as approved at the time of finalisation of design mix to be used in concreting.
5.2.2	ISSUE OF STEEL

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5.2.2.1	The steel shall be issued to the contractor on the following basis (a) Structural Steel: Weighment basis (Unit – MT) (b) Reinforcement Steel and Earthing rod (MS round). : Weighment basis (Unit – MT)
5.2.2.2	All the steel (structural, reinforcement, earthing MS rod,) issued by the 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. The measurement for payment as well as for accounting shall be based on the sectional weights as indicated in the following IS specifications. No rolling tolerances shall be accepted in any case for issue, return of materials, reconciliation and payment purposes. IS: 808 (Latest revision): Beams, Channels and Angles IS: 1730 (Latest revision) Plates, Sheets and Strips/Flats IS: 1732 (Latest revision) Rounds including deformed high yield strength bars. IS:1786 (Latest revision) Reinforcement steel
5.2.2.3	In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding.
5.2.2.4	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.
5.2.2.5	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.
5.2.2.6	The contractor shall submit to the Engineer-in-charge, a statement indicating estimated quantity of steel required during a quarter, at least two months in advance of the 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
5.2.2.7	Bidder to note that steel materials required for foundation bolts, embedded items, etc. other than those supplied by BHEL, etc shall be supplied by the bidder from approved supplier. However, Bidder shall use the scrap materials (if issued by BHEL) for their use in the permanent works as embedment/inserts etc. after

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	necessary store issue formalities and shall be accounted for monthly reconciliation.
5.2.2.8	You have to note that steel required for your enabling job like store/ site office etc shall be arranged at your own cost.
5.3	CONSUMPTION AND WASTAGE RETURN OF MATERIALS
5.3.1	SCRAP & SERVICEABLE MATERAILS:
5.3.1.1	All pipes measuring 2 M and above in length shall be treated as serviceable materials provided, they are in good and acceptable condition. Pipe in less than 2 M length shall be treated as scrap.
5.3.1.2	All TMT measuring 3 M and above in length shall be treated as serviceable materials provided, they are in good and acceptable condition. TMT in less than 3 M length shall be treated as scrap.
5.3.1.3	All structural steel of length above 2m except MS plate shall be considered as serviceable materials provided the material is in good and acceptable condition. Structural steel in length less than 2m shall be treated as scrap.
5.3.1.4	MS plates having both sides greater than 1 meter or if any side is less than 1m but greater than 0.5m and the total area is equal or greater than 2 sq. m. shall be considered as serviceable.
5.3.2	RETURN OF MATERIALS
5.3.2.1	CEMENT
5.3.2.1.1	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-in-charge is satisfied of the physical condition of the cement. Return of such cement to the project stores/ place as identified within the project area by Engineer-in-charge/ BHEL will not be entitled to handling and incidental charges. Surplus sealed and good conditioned cement bags will be taken back on weighment basis.
5.3.2.2	CEMENT CONSUMPTION AND WASTAGE
5.3.2.2.1	The theoretical consumption of cement shall be based on the following. - i.For design mix concrete as per approved design mix. - ii.For nominal mix concrete work, as per minimum cement as specified or as approved by Engineer-in-charge.

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	For item of works, where volume mix is permitted in writing by the BHEL, for masonry works, plaster other miscellaneous items, the cement consumption shall be governed by the “Statement of Cement Consumption” attached to the Delhi schedule of Rates of CPWD-DSR- LATEST REVISION unless otherwise specified in the specifications or the drawing of contract or mutually agreed by Engineer-in-charge and contractor. Actual consumption = Issue – Surplus/ unused quantity of cement returned in good condition by contractor to store. (No sweep cement will be taken back by BHEL).	
5.3.2.3	CEMENT WASTAGE	
	Allowable wastage: One and half percent (+1.5%) of theoretical consumption of cement unless specified otherwise in the technical specification. For any material issued by BHEL to the contractor free of cost, and which is not accounted by the contractor to BHEL, then recovery for such material shall be effected at penal rates.	
	Sl No	Cement consumption Basis of issue & penal recovery
	C-1	Theoretical consumption (without considering any wastage or loss). Free
	C-2	Actual consumption being Limited to one and half percent (+1.5%) of aforesaid theoretical consumption towards allowable wastage Free
	C-3	Actual consumption beyond one and half percent (+1.5%) of above (C-1). Penal rate
5.3.3	STEELS	

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5.3.3.1	RETURN OF STEELS
5.3.3.1.1	All surplus steel and all wastage materials will be taken back on weighment basis.
5.3.3.1.2	Surplus, unused and untampered steel shall be sorted section-wise and returned separately for a place directed by BHEL/Engineer-in-charge within the project area. Return of such materials will not be entitled to any handling and incidental charges
5.3.3.1.3	All wastage / scrap (including melting scrap, wastage, un usable 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.
5.3.3.2	STEEL CONSUMPTION AND WASTAGE
5.3.3.2.1	CONSUMPTION
A	REINFORCEMENT AND EARTHING ROD MS ROUND STEEL 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. i) Actual consumption = Issue – Surplus. Surplus = Un-tampered & unused quantity of steel and ii) Wastage = Actual consumption – Theoretical consumption.
B	STRUCTURAL STEEL, (ROLLED SECTION, PLATES ETC.) CONSUMPTION The theoretical consumption of various sections shall be based on approved drawings. Weights shall be calculated considering the sectional weights as per Indian standard. No extra shall payable to the contractor for any deviation in weights for the two different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances. i) Wastage = Actual consumption – Theoretical consumption
5.3.3.2.2	WASTAGE
A	REINFORCEMENT AND EARTHING ROD MS ROUND STEEL Allowable wastage: - 3% (THREE percent) of the theoretical consumption shall be

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	considered. Wastage shall be considered as cut pieces and scrap material, measured as per actual weighment basis		
	S.No	CONSUMPTION OF REINFORCEMENT AND EARTHING ROD MS ROUND STEEL	BASIS OF ISSUE
	R-1	Theoretical consumption (without considering any wastage, scrap or loss) as per spec. & drg.	Free
	R-2	Wastage limited to plus Three percent (+3%) of the aforesaid theoretical consumption (S-1) towards allowable wastage and returned to BHEL Store	Free
	R-3	Wastage limited to plus Three percent (+3%) of the aforesaid theoretical consumption (S-1) towards allowable wastage but not returned to BHEL Store	Penal rate
	R-4	Wastage beyond three Percent (3%) of the aforesaid theoretical consumption (S-1)	Penal rate
B	STRUCTURAL STEEL, (ROLLED SECTION, PLATES ETC.) WASTAGE.		
	Allowable wastage: - 4% (FOUR percent) of the theoretical consumption shall be considered. Wastage shall be considered as cut pieces and scrap material, measured as per actual weighment basis. Invisible wastage (max limit to 0.5%), if any, shall be considered to be included in the specified 4 % allowable wastage.		
	S.No	CONSUMPTION OF STRUCTURAL STEEL (ROLLED SECTION,	BASIS OF ISSUE

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		PLATES)	
	S-1	Theoretical consumption (without considering any wastage, scrap or loss) as per spec. & drg.	Free
	S-2	Wastage limited to plus Four percent (+4%) of the aforesaid theoretical consumption (S-1) towards allowable wastage including invisible wastages (invisible wastages limited to 0.5% of theoretical consumptions) and returned to BHEL store	Free
	S-3	Wastage limited to plus Four percent (+4%) of the aforesaid theoretical consumption (S-1) towards allowable wastage including invisible wastages (invisible wastages limited to 0.5% of theoretical consumptions) but not returned to BHEL Store	Penal rate
	S-4	Wastage beyond Four Percent (4%) of the aforesaid theoretical consumption (S-1)	Penal rate
5.4	RECONCILIATION OF BHEL ISSUED MATERIALS (FREE OF COST)		
5.4.1	You shall submit a reconciliation statement of steel issued to you, once in a month. The same may be submitted along with RA bill.		
5.4.2	You shall properly account for the material issued to you as specified herein to the satisfaction of BHEL certifying that the balance material are available with your custody at site.		
5.4.3	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 from RA bill.		

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5.4.4	The approved drawings/ bar bending schedules are to be considered for the purpose of reconciliation of materials.	
5.4.5	Reconciliation of steel shall be done on total issue & consumption basis.	
5.5	RECOVERY OF MATERIAL	
5.5.1	If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA bill at the penal rate stipulated below.	
5.5.2	PENAL RATE OF MATERIALS	
	ITEM	PENAL RATE (Rs)
5.5.3	REINFORCEMENT STEEL (Cold rolled steel, high strength, deformed bar or mild steel round bars including earthing rod MS round)	75,000 per MT
5.5.4	STRUCTURAL STEEL MATERIALS. (MS plates, MS flats, rolled steel joists, channels, and angles, MS pipes, Chequered Plates, etc in sizes and lengths as available)	90,000 per MT
5.5.5	CEMENT (OPC/ PPC/PSC)	8000 per MT
6.0	INSPECTION, TESTING AND INSPECTION CERTIFICATES	
6.1	The engineer, his duly authorized representative and / or an outside inspection agency acting on behalf of BHEL / owner shall have access at all reasonable times to inspect & examine the materials & workmanship of the works during its manufacture and if part of the works is being manufactured or assembled on other premises or works, the vendor shall obtain for the engineer and for their duly authorized representative permission to inspect as if the works were manufactured or assembled on vendor's own premises or works. Necessary arrangement for carrying out inspection including supply of labour, IMTEs, area illumination and scaffolding, if required will be vendor's responsibility and same has to be carried out within the quoted price.	
6.2	To facilitate advance planning of inspection in addition to giving inspection notice the vendor shall furnish quarterly inspection program indicating schedule dates of inspection at customer hold point and final inspection stages. Updated quarterly inspection plans will be made for each 3 consecutive months and shall be furnished before beginning of each calendar month.	
6.3	Before any plant / equipment leaves the place of manufacture, BHEL shall be given the option of witnessing inspections & tests for compliance with specifications & related standards. The vendor shall give the engineer / inspector 15 days written notice of any material being ready for testing. Such test shall be to the vendor's account except for the expenses of the inspector. The engineer / inspector, unless	

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	the inspection is waived will attend such tests within 15 days of the date on which the equipment is notified as being ready for test / inspection, failing which the vendor may proceed with test which shall be deemed to have been made in the inspector's presence and he shall forthwith forward to the Inspector duly certified copies of test reports.
6.4	The engineer or inspector shall within 15 days from the date of inspection as defined herein give notice to the vendor of any objection w.r.t. drawing / equipment / workmanship which in his opinion not in accordance with the specification / contract. The vendor shall either make modification as may be necessary to meet the said objection or explain to the engineer/ inspector giving reasons that no modifications are necessary to comply with the contract.
6.5	When the factory tests have been completed at the vendor's or sub-vendor's works, the engineer or inspector shall issue a certificate to this effect within reasonable time after completion of tests but if the tests are not witnessed by the engineer or Inspector the certificate shall be issued within 15 days of the receipt of vendor's test certificate by the engineer inspector. Completion of these tests or the issue of the certificates shall not bind BHEL to accept the equipment should it on further tests after erection be found not to comply with the contract.
6.6	In all cases where the vendor provides the tests at the premises of the vendor or any sub-vendor, the vendor except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the engineer/ inspector to carry out effectively such tests on the equipment in accordance with the contract and shall give facilities to the engineer/ inspector to accomplish testing.
7.0	INSURANCE
	The contractor shall make available the original insurance cover(s) taken by him, against his T&P, assets and workmen compensation and any other cover as may be pertinent to his works and obligatory in terms of law, to BHEL for necessary verification in regard to their adequacy, before commencement of work. However, irrespective of such verification/ acceptance, the responsibility to maintain adequate insurance coverage at all times during the period of the contract shall be of the contractor alone. Such insurance covers to be taken shall be in the joint names of the owner and the contractor. The contractor shall however be authorised to deal directly with the Insurance company(s) and shall be responsible in regard to maintenance of such insurance covers. Insurance covers to be taken by BHEL / Customer shall be as stipulated under relevant clause of Volume-IB.
8.0	DEVIATIONS/ CLARIFICATIONS
8.1	Normally no deviation with respect to tender is acceptable to BHEL. However, in case of unavoidable circumstances, the bidder may submit their query for seeking clarifications of BHEL as per modality stipulated in NIT or may submit the same along with his offer as per prescribed schedule/ format without any ambiguity. Any assumptions, presumptions, deviations etc. indicated or implied anywhere by the bidder except those indicated in the deviation schedule/ format will not be recognized and will not form a part of consideration/ offer. In the absence of such filled-up schedule/ format it will be understood and agreed that the bidder's offer is based on strict conformance to the specification and no negotiation would be allowed in this regard. BHEL reserve the right not to recognize any/ all deviations submitted after opening of the bid.
9.0	DEWATERING

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9.1	Contractor shall ensure at all times that ground of his work area & approach / access roads are free from accumulation of water, so that the materials are safe and the erection / progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL. No separate payments for dewatering of subsoil, surface water or catchments water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL.
10.0	TIME SCHEDULE/ COMPLETION PERIOD
10.1	The entire work under the scope of work shall be successfully completed in all respect within 8 (eight) months from date of start of work, as certified by Construction Manager, BHEL. Mobilization at site shall be done within 20 days from date of written intimation from BHEL. The exact date of start of work shall be reckoned based on certificate of Construction Manager, BHEL.
11.0	TERMS OF PAYMENT
11.1	The contractor shall submit his running bill (RA bill) once in a month at the end of each month in line with payment terms/ billing schedule indicated below. The RA bill complete in all respects accompanied by BHEL engineers certified / measurement sheet, jointly signed, will be paid after passing of the bill subject to completeness & correctness. The measurement will be taken as specified in terms & conditions of contract and certified by the BHEL engineer of actual work. However, no extra payment shall be made in the event of delay in release of payment. 95% pro-rata monthly RA payment shall be considered for payment based on monthly work completion certificate to be issued by BHEL engineer as per approved BBU/Price Schedule. The payment shall be released within 60 days from the date of receipt of complete invoice along with all necessary documents including Engineering Certificate.
11.2	Out of above 95%, 1.5 % of gross bill amount shall be paid in the following manner on certification by BHEL engineer after compliance of each of following activity in each month. In case of non-fulfilment of respective activity by contractor in each month, no payment shall be made by BHEL against corresponding activity and no claim of bidder at a later date, whatsoever, in this regard shall be entertained by BHEL.
11.2.1	0.7 % shall be paid on compliance of housekeeping of contractor's working area and store/ office areas.
11.2.2	0.3 % shall be paid on compliance of general illumination of contractor's working area and stores, office area.
11.2.3	0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.
11.2.4	0.3 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.
11.3	5% of contract value shall be paid along with final bill on completion of job & followings:
11.3.1	(i) Receipt of certificate that all works are completed in all respects;
11.3.2	(ii) Reconciliation of materials / T&P / MMD;
11.3.3	(iii) Completion of final bill formalities and
11.3.4	(iv) Handing over to BHEL.
11.3.5	(v) Confirmation of full GST Credit to BHEL. Any Interest if levied thereon for reasons elaborated in Tax & duties clause of the contract and attributable to you shall be recovered for the Final Payment/ Retention amount.

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11.5	Contractor shall make their own arrangement for making payment of impending labour wages and other dues in the meanwhile.
11.6	Contractor have to submit BHEL entry gate pass for cement, steel, and other materials required for the work, in absence of which their corresponding RA bills shall not be processed.
11.7	Subject to any deduction which BHEL may be authorized to make under the contract, the contractor shall on the certification of the BHEL engineer at site, be entitled to payment explained hereunder.
11.8	The bills will be sent to BHEL, Finance for scrutiny and payment will be made after processing / verification only.
11.9	The measurement will be taken by BHEL engineer as per relevant clause of GCC and certify regarding actual work executed in measurement book and bills for work. However no additional payment shall be made in the event of delay in release of payment beyond the stated period.
11.10	All admissible recovery / adjustment, etc. shall be made from interim payable amount.
11.11	BHEL site at its discretion may split up percentage break up and effect payment to suit the site condition, cash flow requirement, according to the progress of work.
11.12	Applicable GST, which can be claimed at any point, shall be released to you upon compliance of following:
11.12.1	You declaring such Invoice in GSTR-1
11.12.2	Receipt of Goods/ services and Tax Invoice by BHEL
11.12.3	Confirmation of payment of GST thereon by you on GSTN Portal
11.12.4	Above is subject to receipt of goods / service and tax invoice thereof alongwith you declaring invoice in your return and paying GST within timeline prescribed for availing ITC by BHEL.
12.0	MOBILISATION ADVANCE / IBRA
12.1	Interest bearing recoverable advance of 5 (five) % of the contract price in stages is admissible in the following manner. Interest rate shall be the base rate of SBI (on the date of release of advance) plus 6% (compound interest shall be calculated as per monthly rest).
12.2	One and a half (1.5) % to be released on submission of following.
12.2.1	Unqualified acceptance to LOI.
12.2.2	Requisite security deposit.
12.2.3	Bank guarantee (BG) equivalent to 1.1 times the advance amount valid for a period initially for one year subsequently to be extended till the advance is adjusted.
12.2.4	Detailed L-2 network submission & approval by BHEL.
12.3	One and a half (1.5) % to be released on following.
12.3.1	Submission of bank guarantee (BG) equivalent to 1.1 times the advance amount valid for a period initially for one year subsequently to be extended till the advance is adjusted.
12.3.2	Mobilization of Batching plant on certification of the same by BHEL site.
12.3.3	Utilisation certificate of 1st instalment of IBRA with documentary evidence
12.4	Two (2) % to be released as per following.
12.4.1	Submission of bank guarantee (BG) equivalent to 1.1 times advance amount valid for a period initially for one year subsequently to be extended till the advance is adjusted.
12.4.2	Opening of site office & Laboratory on certification of the same by BHEL site.

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12.4.3	Utilisation certificate of 2nd instalment of IBRA with documentary evidence
12.5	Recovery of mobilization advance along with interest shall be made at the rate of 10% of the Gross Bill Value from 1st applicable RA bill, till the amount paid along with the interest is fully recovered by the time the contractor reaches 90% billing of total value of works to be executed.
12.6	The bank guarantee shall be kept valid till the entire advance amount is recovered.
12.7	Invoice for advance against individual stage as per above to be raised immediately & prior to accomplishment of activities/ event, associated with subsequent stage advance.
12.8	All other terms and conditions of IBRA not mentioned above shall be governed by the pertinent provisions of GCC of tender.
13.0	TAXES, DUTIES ETC
13.1	All taxes excluding GST & BOCW Cess (as specified elsewhere in the tender) but including, Charges, Royalties, any State or Central Levy and other taxes for materials if any obtained for the work and for execution of the contract shall be borne by successful bidder and shall not be payable extra by BHEL. Any increase of above at any stage during execution of contract, including extension of the contract, shall have to be borne by successful bidder contractor. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.
13.2	GST along with Cess (as applicable) legally leviable & payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST along with Cess (as applicable) in their quoted rates/ price.
13.3	Successful bidder shall furnish proof of GST registration with GSTN Portal covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by successful bidder on BHEL for this project / work.
13.4	Since GST on output will be paid by BHEL separately as enumerated above, bidder's your quoted rates / price should be after considering the Input Credit under GST law at bidder's end.
13.5	TDS under Income Tax Act shall be deducted as per prevailing IT rules from the bills.
13.6	TDS under GST shall be deducted as per prevailing GST rules from the bills.
13.7.1	You may collect TCS under section 206C(1H) of Income Tax Act, 1961 if applicable.
13.7.2	In case, you collect TCS under section 206C(1H) of Income Tax Act, 1961, following compliance is required.
13.7.2.1	TAN and PAN of vendor should appear in all invoices/claims. Copy of TAN /TCS registration is to be submitted.
13.7.2.2	Amount of TCS and Assessable value on which TCS has been calculated should be specified clearly in the invoice.
13.7.2.3	You shall be required to submit certificate of TCS in Form no. 27D within 15 days from the due date for furnishing the statement of tax collected at the source.
13.7.3	In case, you do not collect TCS under section 206C(1H) of Income Tax Act, 1961, following declaration is to be submitted alongwith each invoice: - "I/We hereby declare that I/We are not required to collect TCS under section 206C(1H) of Income Tax Act, 1961, on this bill.
13.7.4	In event of failure to comply with the provisions of the Act, or proper certificate not issued, or if tax collected but not remitted to the Government, or for any other reason and thereby causing loss to BHEL, the same shall be recoverable from the vendor with applicable interest.
13.7.5	You shall comply with all statutory amendment/notifications in this respect.
13.8	Bidder shall note that GST Tax Invoice complying with GST Invoice Rules (Section

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	31 of GST Act & Rules referred thereunder) wherein the 'Bill To' details shall encompass following. BHEL GSTN – Refer attached GSTN code table of BHEL. Name - BHARAT HEAVY ELECTRICALS LIMITED Address - Shall be intimated later. Specific details of BHEL GSTN, Name and Address as stated above, have been specified elsewhere in the tender.
13.9	Successful bidder to intimate immediately on the day of removal of goods (in case of any supply of goods) to BHEL along with all relevant details and send a scanned copy of Tax Invoice to BHEL through following communication mode for enabling BHEL to meet its GST related compliances. Portal address. and Email address – Shall be intimated later. Specific details of above shall be intimated to successful bidder by BHEL at appropriate juncture.
13.10	In case of delay in submission of above mentioned documents on the date of despatch, BHEL may incur penalty / interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from successful bidder, in case such delay is not attributable to BHEL.
13.11	In case of raising any Supplementary Tax Invoice (Debit / Credit Note), successful bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
13.12	Successful bidder shall comply with the Time Limit prescribed under the GST Law and rules thereof for raising of the Tax Invoice. If any supply of goods is applicable, successful bidder shall also ensure prompt delivery of goods after despatch.
13.13	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 successful bidder along with interest levied/ leviable on BHEL, as the case may be.
13.14	Successful bidder shall upload the invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act, and the same is available to BHEL in FORM GSTR-2A/2B electronically through the common portal. 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 successful bidder along with interest levied / leviable on BHEL.
13.15	Way Bill: Successful bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract. Successful 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 successful bidder and BHEL will not supply any Road Permit/ Way Bill for this purpose.
13.16	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.
13.17	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.

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14.0	IDLE CHARGES
14.1	Not applicable.
15.0	PRICE VARIATION CLAUSE
15.1	The price shall remain firm throughout the contract period including extension period, if any
16.0	OVER RUN CHARGES / RATE REVISION
16.1	No overrun charges/ rate revision will be admissible/ applicable for this contract.
17.0	PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT
17.1	To meet the need of construction management at site, contractor shall provide the following services within quoted/ accepted rates: The bidder will have to supply & install of 2 Nos. PCs (multimedia PC work station Pentium- Core-i5 / i7, 3.2 GHZ or above, 1000 GB HDD, 8 GB RAM, 100 /1000 MBPS LAN card) of HP / HCL / COMPAQ or equivalent make with window 10 or higher, 64 bit O/S and required software like MS Office 2010 or higher, AutoCAD 2014 or higher, ADOBE PDF CREATOR with one no laser jet printer compatible for A3 size printing (ink/ cartridge for which to be supplied as and when required), one no. laser jet printer compatible for A4 size printing (ink / cartridge for which to be supplied as and when required) with power backup at places, as per instruction of BHEL for exclusive use of BHEL. These computers / printers shall remain contractor's property and they will be allowed to take out the same after completion of contract period. The contractor shall provide data / information etc. in prescribed formats for periodical updating of the progress reports, material management reports, updating of network pertaining to the contractor's scope of work etc. The contractor shall also provide 1 (one) number computer operator and 2 (Two) numbers service staff for miscellaneous service for BHEL's use at site / Kolkata for reconciliation, progress review & day-to-day planning purpose, documentation etc. These facilities are to be provided within 30 days from LOI date till completion of scheduled contract period.
17.2	If contractor fails to provide computer / printer / personnel as per requirement, for a continuous period of fifteen days or more, BHEL shall have the right to deduct the amount as per following rates on prorated basis, from contractor's RA bill or any other dues at rate given below:
17.2.1	Rs. 16000 / month for each computer operator.
17.2.2	Rs. 14000 / month for each service staff.
17.2.3	Rs. 10000 / month for each set of computer & printer.
17.2.4	In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to you, above services may either be withdrawn or retained as per instruction of BHEL. If services are retained, you will be reimbursed at the above 70% of the mentioned rate or (actual +15%), whichever is lower, if the services of operator / service staff are being used by BHEL.
17.3	The contractor's site office must have facilities of communications like E-mail, and telephone with STD facility within a month from LOI.
17.4	HOUSEKEEPING
	All construction debris and other garbage shall be continuously collected and disposed at an approved facility. At the end of each day, all waste material shall be removed from the construction Site and deposited at the approved allocated area. The approved procedures to manage waste shall be specified in the

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	Contractor's waste management plan. All empty hazardous material containers shall be removed from the work area as soon as is practicable. All empty gas containers and bottles shall be returned to their storage area and secured properly. The Contractor's shall prepare a pest and vector control program to address specific site conditions, including a mosquito control program.
17.5	PLANNING & MONITORING
17.5.1	The bidder shall prepare detail construction schedule (L-3) as per completion dates given in this document. This schedule must include all milestone and key activities for each subsystem / components in the areas of engineering (wherever applicable), procurement, manufacture (wherever applicable), excavation / construction / erection. This network must conform to the overall project schedule. The bidder should also ensure monitoring of these activities at least weekly basis to start with and on daily basis whenever required by BHEL.
17.5.2	The bidder shall also prepare progress report indicating progress on key activities, management summary for critical activities and list of actions requiring attention of BHEL. This schedule is to be preferably made in PRIMAVERA / MS PROJECTS, so that the same is compatible with BHEL's project management software.
17.6	CONSTRUCTION CAMPS
	The location of work places, camps, areas of storage and installation of works, compression, regulation and communication stations shall be located on levelled land, avoiding areas with non-cohesive soils to avoid erosive processes. Health conditions in the camp shall be controlled in order to prevent contamination of adjacent groundwater or surface water resources. Domestic sewage generated at the construction sites shall be eliminated by two systems of septic/absorption tanks or chemical toilets located on the sites. Solid combustible garbage shall be collected and secured daily, until disposal, to prevent the attraction of livestock, vermins and wild animals. Residue shall be disposed of, along with non-combustible garbage, in a disposal location approved by the Authorities. Upon abandonment, the camp site area shall be cleared of all trailers, piping, cable, insulation, lumber, blockage, metal wastes, etc., and re-graded according to the landscaping concept. These guidelines and procedures for the management of domestic and other waste shall be specified in a plan.
17.7	PROGRESS REPORTING
17.7.1	The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (cement / steel / gases / electrodes) report and other reports as per pro-forma considered necessary by BHEL. In case of any failure on contractor's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills.
17.7.2	The progress report shall indicate the progress achieved against planned with reasons indicating delays, if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippages do not accumulate and effect the overall program.
17.7.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.
17.7.4	Weekly progress review meetings will be held at site during which actual progress

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	during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the contractor shall present program of subsequent week. The contractor shall constantly update/revise his work program to meet the overall requirement.
17.7.5	Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of bidder will be held once in a month at Kolkata / site. These meetings will be attended by reasonably higher officials of the contractor and will be used as a forum for discussing all areas where progress needs to be speeded up. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
17.7.6	During construction contractor shall take an average twenty colour digital photograph / slides each month (not less than four per week) of the works during progress. In case of failure in providing such photograph in each month, an amount of rupees 260 per month shall be deducted from contractor's RA bill.
17.7.7	Successful bidder has to provide for electronic/ computerized storing and re-production / printing / plotting of various data, log sheets, protocols, measurements etc. These may be stored in CD/pendrive/harddisk(as per requirement) and handed over to BHEL as per requirement.
17.8	PHOTOGRAPHS The Contractor shall furnish to the Employer one (1) hard copies (and two (2) soft copies in .jpeg or .pdf format on separate CDs/DVDs/pendrive/harddisk) of each photograph taken to show shop assembly of equipment and the monthly stages of equipment installation. Each photograph shall show upon its face, the date, the Contractor's name, and description of the view taken. Photographs shall be taken of each assembly or sub- assembly to indicate the progress of the Work. Additional photographs shall be taken when and where required as directed by Employer and/or the Engineer. Shop photograph shall be not smaller than 120 mm by 150 mm in size.
17.9	SITE ORGANIZATION
17.9.1	The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all time for smooth execution of the contract headed by a competent construction manager for site operations with sufficient level of authority to take site decisions. The vendor will submit organization chart (showing the name of SITE-IN-CHARGE) with individual bio-data indicating various levels of experts to be posted for supervision in the fields of supervision and execution, quality, material management, planning, safety, etc. The organization shall be reinforced from time to time, as required to make up slippage (if any) from the schedule without any commercial implication to BHEL. The organization chart is to be submitted within 10 days from the date from start of work.
17.9.2	Following (minimum) engineering manpower with power plant construction background to be deployed at site by the successful vendor for their day to day supervision etc.
17.9.2.1	Qualified safety officers with assistants (exclusive for safety supervision for project jobs).
17.9.2.2	Engineer & Supervisors for quality inspection.
17.9.2.3	Site supervising engineer and supervisors for civil works
17.9.2.5	Chemist/Quality engineer for Civil Laboratory
17.9.2.6	Planning Engineer (exclusively for planning)
17.9.3	Deputation of above man-power shall be jointly decided at site in line with

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	construction schedule.	
17.9.4	Engineer / supervisor for other functions like store & purchase, material management, fin, administration etc. are to be provided as per site requirement and not considered above.	
17.9.5	In the event of non-deputation of engineer/ supervisor by the bidder as per above agreed schedule, BHEL shall reserve the right to deduct Rs. 50000/- per month for engineer, Rs. 35000/- per month for the supervisor / safety officer / safety supervisor from RA bills. Further induction of manpower regarding site supervisor & site engineer will be decided at site as per requirement without any financial implication.	
17.9.6	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.	
17.9.7	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.	
17.9.8	The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL.	
17.9.9	The contractor should also submit network programs for the erection of various items. These networks shall show the NTPC/ BHEL hold points, which have to be cleared by NTPC/ BHEL, or their authorized representatives before further erection can take place. These programs for the erection would clearly identify responsibilities of the contractor and NTPC/ BHEL. It is the responsibility of the contractor to get the Networks approved by BHEL within four weeks of the date of finalization of award of work/ placement from start of work.	
18.0	CONSTRUCTION SCHEDULE	
18.1	Entire work shall be carried out in accordance with the broad construction schedule given below, within the stipulated completion period. Within 30 days from start of work, the contractor shall discuss with BHEL site engineer & furnish detail construction schedule (L-3/ L-4) indicating all milestones on the basis of major activities and get it approved from BHEL engineer. This schedule will undergo review and based on progress vis-à-vis project requirement, contractor shall have to submit revised schedule for approval of BHEL. Major Milestones are	
	Major Milestone	Months from date of start of work
18.1.1	Completion of Pile, Pile Cap & Pedestals including backfilling & related balance work of unit 2 & Structural work of compressor House building as per instruction of BHEL	07
18.1.2	Completion of Pedestal for Ash handling System unit 1, 2, 3 & 4 as per instruction of BHEL	03
18.1.3	Dismantling & readiness for foundation for Silo, Transfer point & Trench, Completion of pavement & other works in ESP Unit # 1, 2, 3 & 4 as per instruction of BHEL	07

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18.1.4	Completion of Ash Silo as per instruction of BHEL	04
18.1.5	Completion of Silo Utility Building work as per instruction of BHEL	07
18.1.6	Any other Misc. Job required as per scope to be done as per instruction of BHEL	08
18.2	Contractor shall establish mix design for all concreting from a reputed institution approved by BHEL / Customer.	
18.3	The contractor shall plan his work in such a manner so as to meet the overall project schedule, in consultation with BHEL / NTPC engineer.	
18.4	Contractor shall submit daily work program based on above construction schedule. Deferment of above schedule is not acceptable. Contractor will adhere to schedule and resource planning to be augmented to ensure completion as per schedule.	
18.5	Periodic progress reviews on the entire activities of execution in respect of supply & works in scope of contractor will be held once in a month at Kolkata / site. These meetings will be attended by reasonably higher officials of the contractor and will be used as a forum for discussing all areas where progress needs to be speeded up. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.	
19.0	GUARANTEE / WARRANTY	
19.1	The contractor will be responsible for the quality of workmanship, quality of materials / items and design for which the contractor is responsible.	
19.2	Guarantee period shall be 12 months from the date start of guarantee period as per relevant clause of GCC. Commencement of guarantee period shall be from the date completion of work under the contract as certified by BHEL	
20.0	DELETED	
21.0	CONTRACT PRICE	
21.1	Bidder shall quote their rates strictly in accordance with prescribed Price Schedule, Volume-III (latest revision).	
22.0	QUALITY CONTROL & QUALITY ASSURANCE	
22.1	Contractor's engineers & supervisors shall be adequately qualified and also inclined to do a quality job. The quality assurance engineer shall co-ordinate all aspects of quality control, inspection, implementation of quality assurance procedures laid down in Quality Plan and technical specification by BHEL. He shall fill up quality assurance log sheets / formats and submit to BHEL for joint inspection and acceptance. The contractor shall fill up, maintain & preserve the quality records in computerized media. BHEL's authorized representative shall be given free access at all time to such quality related records etc. for inspection, review etc.	
23.0	QUALITY ASSURANCE PROGRAMME	
23.1	The contractor shall arrange for suitable quality assurance programme to control all activities pertaining to the scope of work, as necessary. Such programs shall be outlined by the contractor & shall be finally accepted by BHEL. A quality assurance programme of the contractor shall generally cover the following	
23.2	Organization structure and qualification data for key personnel of the contractor for the management and implementation of proposed quality assurance programme	
23.3	The procedure for source inspection, incoming raw material inspection, verification of material purchased etc.	
23.4	System for maintenance of records.	
24.0	GENERAL REQUIREMENTS – QUALITY ASSURANCE	

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24.1	All materials, components and equipment covered under the specification shall be procured, manufactured, erected, commissioned and tested, as applicable, at all stages as per comprehensive quality assurance program. An indicative program for inspection / test, to be carried out by the contractor, for some of the major items is given in the respective technical specification.
24.2	Field quality plan will detail out the quality practices and procedures etc. to be followed by the contractor's site quality control organization, during various stages of site activities from receipt of material / equipment at site.
24.3	BHEL reserves the right to carry out quality audit and quality surveillance of the systems and procedures of contractor's quality management. Contractor shall provide all necessary assistance to enable BHEL to carry out such audit.
24.4	Quality audit / approval of the results of test & inspection will not prejudice the right of BHEL to reject an equipment service not giving desired performance and shall not in any way limit the liabilities and responsibilities of the contractor in earning satisfactory performances of equipment/ service as per specification.
24.5	Repair / rectification procedure to be adopted to make any job acceptable shall be subject to the approval of BHEL.
24.6	All the latest relevant codes as per technical specification should be available with the contractor at site within 15 days from the date of placement from start of work or otherwise specified by Construction Manager/ Project Manager, BHEL.
25.0	HEALTH SAFETY & ENVIRONMENT
25.1	Bidder has to strictly follow and comply the HSE norms as specified in the following documents as attached with this tender: Document Number: HSEP:14-ER Rev.: 01, DATE: 08.05.2020 Document Title: Health, Safety and Environment Plan for Site Operation by Subcontractors. Document Number: HSEOCP: 61A, Rev. 00, DATE: 27.04.2020 Document Title: Operational Control Procedure. Document Number: HSEOCP: 61, Rev. 01, DATE: 01.06.2020 Document Title : Operational Control Procedure
25.2	SALIENT FEATURES & DESIGN CONCEPT OF LABOUR COLONY Labour Colony, if established by the contractor shall comprises of: i. Labour Sheds for male labours. ii. Cubicles for labours staying with families. iii. Land for Labour Colony is required to be leveled to avoid water logging. iv. Provision of electricity (including ELCB of 30 mili amp. for safety), lighting fixtures and fans. Provision of DG set for backup power, to ensure power in the evening hours. v. Community kitchen and common toilets/ bath rooms. vi. Provision of Primary Health Centre, Canteen and shops for essential commodities (common for all modules). vii. Bore well for potable water, WBM roads / Brick on edge pathways and sewage system preferably with septic tank and soak pit. viii. General area lighting ix. Provision for common open space for children's play/community/recreational activities.

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	x. Fencing for safety and security. Brief description of the above mentioned Labour sheds for male labours is furnished herein: a) Labour Shed for Male labourers This building shall be Load Bearing structure having 230 thick brick wall with CC floors and Pre-Coated G.I sheet roofing. For the Labour hutment modules, floor height shall be as per architectural drawing attached. Connecting corridor, Cooking area and Toilet and Bathroom with each module shall be provided. The building walls shall comprise of 230 / 115 mm thick FPS bricks/ fly ash bricks (if available near the project site) from ground floor to roof level. Footing shall be provided according to Soil investigation report approved by NTPC. The grade of concrete for RCC frame (including foundation) shall be M25 (If required). Each module of this labour sheds shall be Single storied and shall be provided within 57M x 27M approximate plot area for 128 labour. Brick masonry wall shall be provided for the full height of the building for both external and internal walls. Floor height shall be minimum 2.40m. A connecting corridor, Cooking area and toilets shall be provided at operating floor level. The floor of the labour sheds, connecting corridor, toilet / bath, Kitchen and wash area shall have minimum cement concrete flooring. The roof shall be pre-coated GI sheet with specifications as per DSR 2018 item no 12.50 over MS pipe / structural steel truss and purlins. MS window with grill / CC jail shall be provided for windows and ventilator. 35 mm thick flush Doors of non-decorative type shall be provided with commercial veneered painted with Synthetic enamel paint. (Specifications shall be as per DSR 2018 item no 9.21) Road network, Proper drainage and sewerage network with septic tank, soak pit and potable water supply shall be provided within labour colony. Walls shall be plastered with 12mm / 15 mm thick cement plaster. Internal wall shall be finished with Dry Distemper. Doors/ windows and other steel item shall be finished with synthetic enamel paint over suitable primer. External finishing shall be of Acrylic smooth exterior paint. (Drawing for Labour shed is attached herewith for reference) b) Cubicles for labourers staying with families, Primary Health Centre, Canteen and shops for essential commodities shall be designed and Executed by the Contractor in association with the drawings attached for labour sheds for male labours. c) All buildings and structures shall be architecturally treated in such a way so as to be in complete harmony with the main power house area buildings, surrounding structures and environment. Due considerations shall be given to landscape design, and interior design. For adequate light and ventilation, National Building Code recommendations shall be followed. All the buildings shall be architecturally designed to meet the National Building Code requirement. In addition to the above said facilities Contractor has to provide following for labours:- a) Proper sanitation in labour colony. b) Clean and safe drinking water facilities both at colony and work place. c) Proper lighting facilities. d) Construction of rest rooms at work place. e) Construction of Child care rooms for female labours. f) Proper canteen facilities as work place. g) Ambulance and minimum first aid facility at work place.
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	h) Construction of toilets for Gents and Ladies at work place. i) Recreation facilities for labourers in Colony.
26.0	LIQUIDATED DAMAGE / PENALTY
26.1	Intermediate Milestones
26.1.1	In case delay in achieving the Milestone as mentioned in Clause 18.1.2 & 18.1.4 above, 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.
26.1.2	In case delay in achieving the Milestone as mentioned in Clause 18.1.1,18.1.3& 18.1.5 above, 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.
26.1.3	Amount already withheld, if any against slippage of clause 18.1.1, 18.1.2, 18.1.3,18.1.4& 18.1.5 above, shall be released only if there is no delay attributable to contractor in achievement of Milestone as mentioned in clause 18.1.6 above.
26.1.4	Amount 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.
26.1.5	Final deduction towards LD (if applicable), 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.
26.1.6	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.
Notes:	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 the Milestone.
27.0	PERFORMANCE BOND & SECURITY DEPOSIT
27.1	Performance bond is not applicable.
27.2	The total amount of Security Deposit will be 3% of the contract value. Other terms related to Security Deposit shall be as per GCC.
28.0	CERTIFICATE TOWARDS COMPLETION
28.1	The work under the scope of the contractor shall be deemed to have been completed in all respects only when so certified by BHEL / owner. The decision of BHEL in this regard shall be final and binding on the contractor.
29.0	CIVIL LABORATORY
29.1	Contractor shall establish and maintain civil laboratory with necessary equipment (as per Annexure-A) for conducting relevant tests at site, as required. Any testing required to be carried out at site as per joint discussion at site and technical specification have to be arranged by you for all the works at your own cost.
30.0	EXTENSION OF TIME FOR COMPLETION
30.1	Shall be governed as per GCC
31.0	PAYMENT FOR ADDITIONAL/EXTRA ITEMS FOR WORKS
31.1	It shall be as per relevant clause of the GCC.
32.0	TOOLS & PLANTS (TO BE PROVIDED BY CONTRACTOR)
32.1	Tentative list of T&P to be deployed by contractor for successful completion of work is detailed below. No T&P shall be provided by BHEL

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32.2	It may be noted that the list is not exhaustive and is only for general guidance. The contractor is required to provide all necessary T&P (other than those specified to be provided by BHEL, if any) measuring (calibrated) instruments & handling equipment to maintain work progress for timely completion of total work as per contract. In case of project requirement, some activities may have to pre-pone. In such cases the contractor may have to deploy additional T&P. Quoted rate shall be inclusive of such emerging requirements. However, contractor shall submit deployment plan of all T&P along with tender bid.	
32.3	In the event of any failure on the part of the contractor to deploy T & P to sustain desired work progress, BHEL may at his discretion also terminate the contract on this ground and take out any or whole amount of the contract from the scope of the contractor. In the event of failure of contractor to deploy necessary and sufficient T&P/ IMTEs to maintain work progress, BHEL will be at liberty to arrange the same at the risk & cost of contractor including transportation cost of same from any of BHEL site/ other agency & charges as applicable shall be deducted from contractor's RA bill. Decision of BHEL in this regard will be final & binding on contractor.	
32.4	Following Major T&Ps to be arranged by contractor within the indicated time	
	Major T&P items	Deployment Schedule from LOI date
32.4.1	1 Nos. Hydraulic Pile Rig Crawler mounted	As desired by Construction Manager
32.4.2	2 Set. Conventional DMC / RMC / TMR piling rigs and accessories	1 Sets within 15 days and balance within 45 days
32.4.3	Two Sets of Pile Load Test arrangement	1 Set. within 30 days balance 1 No. within 60 days
32.4.4	2 Nos. Hydraulic Excavator / Poclain	1 st within 45 days & 2 nd as per requirement
32.4.5	1 no. dozer	Within 30 days
32.4.6	5 Nos. dumper	3 Nos. within 45 days balance 2 Nos. as per requirement
32.4.7	1 no. vibromax /earth compactor	Within 60 days
32.4.8	1 No. Jack Hammer with Compressor	Within 60 days
32.4.9	1 no 18/20 T crawler crane	Within 30 days
32.4.10	1 no hydra (10 / 12 T capacity) or equivalent	Within 40 days
32.4.11	Welding rectifier (as per requirement)	Within 30 days
32.4.12	1 No. stationary automatic batching plant with printing facility (approx. 20 Cum/Hr.) – to be commissioned at site.	As per requirement
32.4.13	1 No. stationary /Mobile automatic batching equipment with printing facility (approx. 10 Cum/Hr.) – to be commissioned at site.	As per requirement
32.4.14	3 Nos. transit mixer (4.5/5/6 M3 capacity)	2 Nos. Within 40 days balance as per requirement
32.4.15	2 no concrete pump (20 cum/hr. min capacity) or 1 no. Truck mounted concrete mixer cum pump along with placing boom minimum 36 m Length	Within 60 days balance as per requirement
32.4.16	2 Nos. self-priming dewatering pump 10 HP (diesel/ electric)	1 no. Within 40 days balance 1 no. within 75 days
32.4.17	2 Nos. self-priming dewatering pump 5 HP or higher(diesel/ electric)	1 no. Within 30 days balance

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		1 no. within 75 days
32.4.18	2 Nos. reinforcement bending machine	1 no. Within 30 days balance 1 no. within 60 days
32.4.19	2 Nos. reinforcement cutting machine	1 no. Within 30 days balance 1 no. within 60 days
32.4.20	1 no compression testing machine (200 T cap)	Within 50 days
32.4.21	7 Nos. Concrete vibrator with adequate needle (3 Nos. diesel driven + 4 Nos. electric driven)	4 Nos. Within 50 days & 2 Nos. within 75 days
32.4.22	1 No. total station	Within 20 days
32.4.23	2 Nos. auto level & staff	Within 20 days
32.4.24	1 Nos. DG set 125KVA	Within 30 days
32.4.25	Concrete compressive strength testing moulds – 75 Nos.	Within 50 days
32.4.26	1 no trailer – 20T,	Within 50 days
32.4.27	1 no drinking water tank – 2000 lit.	Within 20 days
32.4.28	Portable fire extinguishers as below: Soda acid – 3 sets. Dry chemical powder – 3 sets CO2 – 3 sets. Water & sand bucket (4 buckets in one stand) – 3 sets. Fire hose with nozzle (50 M length) – 3 sets	Within 70 days from start of work
32.5	T&P shown in the above mentioned list are tentative based on planned progress requirement. Actual Mobilization schedule, based on front availability, drawings, construction schedule and material availability at site is to be reviewed and mutually agreed with CM, BHEL site periodically from time to time for mobilization of major T&Ps, and the same have to be adhered to. No change will be permitted without written approval of Construction Manager, BHEL site. Further requirement will be reviewed time to time at site and contractor will provide additional T&P/equipments to ensure completion of entire work within schedule time without any financial implication to BHEL. All other T&Ps shall be provided by the contractor without any extra cost to BHEL. Vendor will give advance intimation & certification regarding capacity etc. prior to dispatch of heavy equipments.	
32.6	All T&P and all IMTEs, which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor at his own cost in working condition.	
32.7	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 at the following rates:	
	Major T&P items	Recovery rates
32.7.1	Hydraulic Pile Rig Crawler mounted	Rs. 20000/- per week or part thereof
32.7.2	Pile Load Test arrangement	Rs. 10000/- per week or part thereof
32.7.3	Hydraulic Excavator / Poclain	Rs. 15000/- per week or part thereof
32.7.4	Dozer	Rs. 10000/- per week or part thereof
32.7.5	Dumper	Rs. 2000/- per week or part thereof
32.7.6	Vibromax / Earth compactor	Rs. 5000/- per week or part thereof
32.7.7	Jack Hammer with Compressor	Rs. 1000/- per week or part thereof
32.7.8	18/20 T crawler crane	Rs. 2000/- per week or part thereof
32.7.9	Hydra (10 / 12 T capacity) or equivalent	Rs. 3000/- per week or part thereof

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32.7.10	Welding rectifier (as per requirement)	Rs. 700/- per week or part thereof
32.7.11.1	Stationary automatic batching plant with printing facility (approx. 20 Cum/Hr.)	Rs. 25000/- per week or part thereof
32.7.11.2	Stationary automatic batching plant with printing facility (approx. 15 Cum/Hr.)	Rs. 15000/- per week or part thereof
32.7.12	Transit mixer (4.5/5/6 M3 capacity)	Rs. 7500/- per week or part thereof
32.7.13	Concrete pump (20 cum/ hr. min capacity) or Truck mounted concrete mixer cum pump along with placing boom minimum 36 m Length	Rs. 10000/- per week or part thereof
32.7.14	Self-priming dewatering pump 10 HP (diesel/ electric)	Rs. 200/- per week or part thereof
32.7.15	Self-priming dewatering pump 20 HP or higher(diesel/ electric)	Rs. 300/- per week or part thereof
32.7.16	Reinforcement bending machine	Rs. 1000/- per week or part thereof
32.7.17	Reinforcement cutting machine	Rs. 1000/- per week or part thereof
32.7.18	Compression testing machine (200 T capacity)	Rs. 2000/- per week or part thereof
32.7.19	Concrete vibrator with adequate needle	Rs. 500/- per week or part thereof
32.7.20	Total station	Rs. 500/- per week or part thereof
32.7.21	Auto level & staff	Rs. 300/- per week or part thereof
32.7.22	DG set 125KVA	Rs. 5000/- per week or part thereof
32.7.23	Concrete compressive strength testing moulds	Rs. 100/- per week or part thereof
32.7.24	Trailer – 20T,	Rs. 5000/- per week or part thereof
32.7.25	Drinking water tank – 2000 lit.	Rs. 500/- per week or part thereof
32.7.26	Portable fire extinguishers as below: Soda acid – 3 sets. Dry chemical powder – 3 sets CO2 – 3 sets. Water & sand bucket (4 buckets in one stand) – 3 sets. Fire hose with nozzle (50 M length) – 3 sets	Rs. 1000/- per week or part thereof
32.7.27	Any other instrument	As per discretion of the engineer
33.0	OTHER TERMS	
33.1	All other term & conditions of this specification shall be governed by the pertinent provisions of GCC and other volumes of this tender, as applicable.	

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ANNEXURE- A
LIST OF EQUIPMENTS FOR CIVIL SITE LABORATORY

CONCRETE TESTING EQUIPMENT				
SL NO.	NAME OF TEST	NAME OF EQUIPMENT	SIZE OF EQUIPMENT	IS REF.
1	Initial & final setting time, Consistency of cement	Vicat Apparatus with desk pot	Standard	IS 5513
2	Aggregate crushing value test	Crushing value apparatus	Standard	IS 2386
3	Flakiness index	Thickness gauge for measuring flakiness index	Standard	IS 2386
4	Elongation Index	Elongation gauge	Standard	IS 2386
5	Bulk density, voids and bulking apparatus	Measuring cylinders	3, 5,10 & 15 liters cylinders	
6	Concrete Compressive test	Digital / analog Compressive Testing Machine with 2000 KN capacity.	2000KN capacity	IS 2505
7	Cement mortar cube casting	Mortar Cube mould	70.6 x 70.6 x 70.6 mm, minimum 10 sets desired.	IS 10086
8	Concrete Cube casting	Concrete Cube Mould	150x150x150mm, minimum 75 sets desired considering major concreting activity.	IS 10086
9	Workability of concrete	Slump cone	Standard, at least 04 nos.	IS 456
10	Specific gravity of aggregates	Pycnometer	Standard, at least 02 nos.	IS 383
11	Cement mortar cube vibrating	Motorised vibration machine for cement testing	Standard	IS 4031
12	Course aggregate Sieve analysis (Concrete & Road Works)	Sieve set	450mm dia. GI Frames Size: 125 mm, 90 mm, 75 mm, 63 mm, 53 mm, 40 mm, 20 mm, 16 mm, 12.5 mm, 10 mm, 4.75 mm, Pan and cover	IS 383
13	Fine aggregate sieve analysis	Sieve set	200 mm dia. Brass sieves; Size 4.75 mm, 2.36 mm, 1.18 mm 600 micron, 300 micron, 150 micron,	IS 383

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			75 micron, 75 micron, Pan and cover	
14	Silt content check	Sand silt content beaker	Standard	

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SL NO.	NAME OF TEST	NAME OF EQUIPMENT	SIZE OF EQUIPMENT	IS REF.
Soil Testing Equipment (Levelling & Grading)				
1	Core Cutter test	core cutter apparatus	Rammer, 6 nos. of std. core cutter mould, dolly	IS 2720
2	Proctor density test	Std. proctor Compaction apparatus	Standard	IS 2720
3	Moisture Content	Rapid moisture meter	Standard, atleast 04 nos.	IS 2720

Process Control Accessories				
1	Hot air oven	Temperature range 50° C to 300° C	600x600x600mm (min. .size)	
2	Electronic balance	3 nos.	600gx0.01g, 10 Kg and 50 kg	
3	Physical balance	5 kg capacity	Weights upto 5 kg	
4	Thermometer 3 Nos.	Temperature range 0° C to 150° C	Digital	
5	Measuring jars	2 nos. set of each size	100ml, 200ml, 500ml & 1000 ml	
6	Gauging trowel	4 nos.	100mm & 200 mm with wooden handle	
7	Spatula	2 nos. each size	100mm & 200 mm with long blade wooden handle	
8	Stainless steel scoop	2 nos. each	2 kg and 5 kg	
9	Vernier calipers	2 nos. each	12" and 6" Sizes	
10	Digital pH meter	01 nos.	.01 mm least count	
11	Digital micrometer	01 nos.	0.01 mm least count	
12	GI tray	02 nos. each	600x450x50mm, 450x300x40mm, 300x250x40mm	
13	Screw Gauge	02 nos.	0.1 mm-10mm, Least count 0.05	