

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BALANCE CONSTRUCTION WORK OF 1 NO 180M HEIGHT RCC SINGLE FLUE CHIMNEY OF U#1&2 COMPLETE IN ALL RESPECT INCLUDING CHIMNEY RCC WIND SHIELD, FABRICATION & ERECTION OF STEEL FLUE CANS, INSTALLATION OF BOROSILICATE GLASS BLOCK LINING ON INNER SURFACE OF STEEL FLUE CAN, ERECTION OF SHOP FABRICATED STRUCTURAL PLATFORMS, INSTALLATION OF ELECTRICAL ITEMS IN CONFORMITY WITH THE APPROVED LAYOUT ETC TO COMPLETE THE CHIMNEY IN ALL RESPECT **BUT EXCLUDING PILE & RAFT** OF FGD SYSTEM AT 4 X 210 MW, STAGE-I & 3 X 500 MW, STAGE-II NTPC KAHALGAON, BIHAR.

BHARAT HEAVY ELECTRICALS LIMITED



TECHNICAL CONDITIONS OF CONTRACT (TCC)

CONTENTS

Sl No	DESCRIPTION	Chapter
Volume-IA	Part-I: Contract specific details	
1	PROJECT INFORMATION	Chapter-I
2	SCOPE OF WORKS	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	MATERIAL	Chapter-IX
10	BOQ CUM RATE SCHEDULE AND % WEIGHTAGE OF INDIVIDUAL ITEMS	Chapter-X
11	TECHNICAL SPECIFICATIONS AND DRAWINGS	Chapter-XI

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - I: PROJECT INFORMATION

Sl. No.	Description	Details
1	Project Title	Flue Gas Desulphurization (FGD) system Package for 4x210 MW Stage-I & 3X500 MW Stage-II at NTPC Kahalgaon, Bihar
2	Customer	National Thermal Power Corporation Limited (NTPC Limited)
3	Location	Kahalgaon is located in Bhagalpur district of Bihar. The project is well connected by Bhagalpur - Sahib Ganj State Highway.
4	Nearest Airport	The nearest airport is Jay Prakash Narayan International Airport, Patna at a distance of about 250km from project site.
5	Access By Road/Major Cities	<p>Nearest National Highway NH-80 is at a distance of about 8km from the project.</p> <p>The nearest major town/city is Bhagalpur, which is approx. 30km from the project.</p> <p>The nearest railway station is Colgong (Kahalgaon) at 2Km.</p>
6	Temperature	Meteorological data from nearest observatory is placed as a Annexure-II (Attached)
7	Seismic Zone	As per Annexure-E of NTPC Technical Specifications, Section-VI, part-B (Attached).
8	Wind Speed	Meteorological data from nearest observatory is placed as a Annexure-II.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - I: PROJECT INFORMATION

INSTRUCTIONS TO BIDDERS		
1.1.	The Bidder shall visit project site and acquire full knowledge and information about conditions prevailing at site and in & around the plant premises, together with site conditions, transportation routes, various distances, all the statutory, obligatory, mandatory requirements of various authorities and all information that may be necessary for preparing the bid and entering into the Contract. All costs for and associated with site visits shall be borne by the bidder.	
1.2.	Other contractors would be working in this area and their structures are to be protected. The material brought and stacked for construction should not make hindrance to other contractors.	
1.3.	The information given herein is for general guidance and shall not be contractually binding on BHEL/Owner. All relevant site data /information as may be necessary shall have to be obtained /collected by the Bidder.	
1.4.	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.	
1.5.	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.	
1.6.	Bidders may fix up their site visit in consultation with below mentioned contact person:	
	Name:	Mr. Lal Bihari Sah
	Designation:	Manager
	Email:	lbs@bhel.in
	Ph no:	9835466178
	Name:	Mr Manoj Ghosh
	Designation:	Sr. Engineer
	Email:	manoj_ghosh@bhel.in
	Ph no:	9434231555

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.0	Scope of Works:
2.1.	Balance construction work of 1 No 180M height RCC Single Flue Chimney of U#1&2 complete in all respect including Chimney RCC wind shield, fabrication & erection of steel flue cans, installation of Borosilicate Glass Block Lining on Inner Surface of Steel Flue Can, erection of shop fabricated structural platforms, installation of electrical items in conformity with the approved layout etc to complete the chimney in all respect but excluding pile & Raft of FGD system at 4 X 210 MW, Stage-I & 3 X 500 MW, Stage-II NTPC Kahalgaon, Bihar
2.2.	<p>Construction of One (1) No. single flue RCC Chimney of 180 mtr. height chimney of U#1&2 complete in all respect including:</p> <ul style="list-style-type: none">a. Construction of One (01) No. 180 meter height reinforced concrete single flue steel lined chimney and other incidentals as detailed in the specification in the tender document including providing all labour, materials (except those which are specifically mentioned to be issued by BHEL as Free of Cost (FOC) Items), consumables, equipment, temporary works, temporary storage sheds, temporary colony for labour and staff, temporary site offices, construction plants, transportation/handling and all incidental items not shown or specified but reasonably implied or necessary for the completion of subject scope, all in strict accordance with the specifications including revisions and amendments thereto as may be required during the execution of work.b. Supply including design, receipt, unloading, erection, testing and commissioning of stack elevator and electrical equipment's; allied items, cabling, earthing, spares etc. are also under the scope of this work. The complete works have to be carried out by providing all labour, supervision, materials, scaffolding, power, fuel, construction equipment's, tools & plants, inspection, measuring, testing instruments, supplies, transportation, storage, and all incidental items not herein specifically mentioned but reasonably or found required for the successful completion of work including contractor's and where necessary manufacturer's expert supervision in strict compliance with the requirement of this specification and approved construction drawing.c. Installation of Borosilicate Glass Lining inside MS Flue Cans, including surface preparation, application of primer, adhesive etc. as per the technical specifications and approved erection procedure under the expert supervision of Borosilicate Glass Lining manufacturer /supplier. The complete works have to be carried out by providing all labour, supervision, materials, scaffolding, power, fuel, construction equipment, tools & plants, inspection, measuring, testing instruments, supplies, transportation, storage, and all incidental items not herein specifically mentioned but reasonably or found required for the successful completion of work. Borosilicate Glass Lining Materials, Primer, Adhesive (suitable fixing materials) and Expert Supervision of Manufacturer shall be provided by BHEL as Free of Cost (FOC) Items.
2.3.	The bidder's scope shall include excavation in soil and rock (if any with/without blasting as per the site conditions), dewatering, dressing to required profile, backfilling around

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	completed structures and plinth filling, plinth protection, disposal of surplus earth and rock, concreting including Reinforcement and Formwork, Masonry work, Plastering, Painting, Flooring, Installation of borosilicate lining, Doors/Windows, Ventilators, Fire Proof Doors, Insulation, Roof Water Proofing, Dismantling of existing structures (below ground and above ground- RCC, Brick Works, Sheeting, Structural steel and Other facilities), RCC and Brick/ Block masonry and Steel Structures, fabrication and erection of all structural steel and miscellaneous steel (i.e. steel stair case, cable/duct/pipe supports, ladders, walkways, railing, Chequered plate/grating floor, inserts, anchor bolts, etc.), paving, Embedment, Earthing, Gravel filling, Precast covers, Expansion joints, Rain water pipe, Insulation, Gates/Valves, Water proofing of underground structures, Trenches, Final grading and site clearance before handing over to Owner and other auxiliary items of work, etc. all complete including supply of all materials (except those which are specifically mentioned to be issued by BHEL as Free of Cost (FOC) Items), consumables, labor, Tools and plants, transportation and storage, Sample Testing etc. all complete as per BOQ, specifications and drawings for proper and successful execution of the job for FGD at 4 X 210 MW, Stage-I & 3 X 500 MW, Stage-II NTPC Kahalgaon, Bihar.
2.4.	The complete works have to be carried out by providing all labour, supervision, materials, scaffolding, power, fuel, construction equipment, tools & plants, inspection, measuring, testing instruments, supplies, transportation, storage, and all incidental items not herein specifically mentioned but reasonably or found required for the successful completion of work.
2.5.	<u>Supply of Materials: -</u> <ul style="list-style-type: none">a) Cement, Structural Steel & Reinforcement Steel (TMT) for the item of work wherever specifically mentioned in BHEL's scope, shall be supplied by BHEL free of cost.b) Borosilicate Glass Lining Materials, Adhesive (suitable fixing materials) and Expert Supervision of Manufacturer shall be provided by BHEL as Free of Cost Itemsc) Reinforcement Steel required for the items of works wherever specifically mentioned in Price Schedule in BHEL's scope, shall be procured by BHEL and issued to contractor as free of cost (FOC) Item. However, unloading, handling / storage of Reinforcement steel procured by BHEL for this tender scope, at site, inside BHEL Stores / Contractor's Stores and further transportation from Stores to work area will be in the scope of contractor. No Extra payment shall be made for this work.
2.6.	<u>Fabricated Structure Steel Supply:</u> <p>Structural Steel required for the items of works wherever specifically mentioned in Price Schedule in BHEL's scope, shall be procured by BHEL and issued to contractor as free of cost (FOC) Item.</p> <p>All steel structures (vendor's scope supply) shall be fabricated in factory, transported and erected at site. All factory fabricated structures shall have bolted field connections. Chimney flue liners can either be fabricated at factory in segments, transported and welded at site before erection or fabricated at site. However, BHEL will issue required material at site only. For Chimney flue liners, to prevent flue gas leakages, the applicable field joints shall necessarily be welded. Structural Steel shall be fabricated at a suitable fabrication shop, outside the plant premises.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	<p>BHEL will visit the fabrication shop of Contractor to examine its suitability for the scope of work involved. However, contractor's fabrication shop shall be adequately equipped to handle the scope of work involved within the given time schedule. Any modifications / alterations as required to carry out the works shall be done by contractor at his own cost. No claim / compensation for delay in works on this account will be admitted.</p> <p>Contractor shall designate separate areas inside its fabrication shop for storage of Raw Materials as well as fabricated materials for this tender's scope and materials supplied for this work shall solely be utilized for this tender's purpose only. Safety, Watch and Ward, Insurance of the materials procured, fabricated and stored inside fabrication shop and transit insurance shall be the responsibility of the contractor. No claims / compensation on account of damage / theft of materials which is in the custody of contractor shall be permitted.</p> <p>Contractor shall give due notice in advance to BHEL for Stage Inspection of the works being carried out at its fabrication shop as per the approved FQP. However, BHEL Engineer shall be entitled to visit the Contractor's Fabrication shop at any feasible time during the period of execution to examine the progress and quality of work. Contractor shall always maintain all such records and provide facilities / equipment / MMEs as required by BHEL's Engineer for inspection of works within the quoted rates. Fabricated Structural Steel shall be dispatched from the shop only after getting the due clearance from BHEL /Customer.</p> <p>Transportation of fabricated structure steel / Raw Structure Steel from shop to site, Unloading, Handling / storage, at site, inside BHEL Yard / Contractor's store, will be in the scope of contractor. No extra payment for unloading / handling / transportation shall be paid to contractor</p>
2.7.	The scope shall also include setting up by the bidder a testing room with compressive strength testing machine and other site test instruments for conducting day to day testing of concrete cubes, compaction of earth & road work, brick & other material testing. One qualified quality engineer to be deployed as necessary.
2.8.	The scope of work also includes setting up batching plant with capacity of minimum 30 Cum. All machineries, 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 Engineer and joint protocol to be maintained by contractor
2.9.	Mix design (M25, M30 and M35 or above) for all concreting shall be carried out either at site or from a reputed institute as per instruction of BHEL and should get the mix design approved by BHEL/ NTPC prior to start of work. Contractor has to ensure adding of admixture and minimizing of cement content in line with latest revisions of IS 456, IS 10262 and other relevant codes as advised by BHEL time to time without any additional cost.
2.10.	The working area shall be separated from the existing plant area by cordoning off the area by providing MS / GI sheets of suitable heights with appropriate frame work as approved by BHEL/ Customer. No extra payment shall be paid to contractor for this work.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.11.	The Customer National Thermal Power Corporation (NTPC) 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 implication to BHEL.
2.12.	The work under this contract shall be carried out as per BOQ Cum Rate Schedule. In case the description / specifications as per BOQ are found to be incomplete, Indian standard specifications shall be followed. Quantities mentioned in the BOQ cum Rate schedules are approximate only and liable for variation due to change of scope of work / variation in schedule of quantities, changes in design etc. The tenderers shall undertake to execute actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually executed at site and payments will also be regulated for the same. The quantities indicated against each item may vary to any extent and no compensation will be payable in variation of Individual quantity.
2.13.	The complete works shall be carried out as per BOQ cum Rate schedule. If any work covered in the scope of contract cannot be executed using items available in BOQ, additional / extra items shall be made and rates for such items shall be worked out as per tender. However, contractor shall be bound to execute all the works under the scope of the contract and decision whether an extra item is applicable or not, shall be taken by BHEL Engineer which will be binding on the contractor.
2.14.	Any activity which is necessarily required for satisfactory execution of any item of BOQ in line with technical specifications shall be deemed to be included in BOQ item even if it is not described in the item description and no extra payment shall be made against such activity.
2.15.	The technical requirements for work to be executed under this specification shall be as per Specifications enclosed with this tender document.
2.16.	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.
2.17.	Contractor's scope also includes following:
2.17.1.	Furnishing all labor, materials (except those specified in BHEL scope), supervision, construction plans, equipment, supplies, transport to and from the site, materials handling, fuel, electricity, compressed air, water, transit and storage insurance and all other incidental items and temporary works not shown or specified but reasonably implied or necessary for the proper completion, maintenance and handing over the works, in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by BHEL Engineer during the course of works.
2.17.2.	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.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer.
2.17.3.	Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that are required for all works including temporary works.
2.17.4.	Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.
2.17.5.	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 implied and necessary for completion of the job as a whole all as desired and as directed by the engineer.
2.17.6.	The scope of work covered above is not a comprehensive list of items of work involved. The detail scope of work may vary considerably depending on the actual construction requirements.
2.18.	APPROVED MANUFACTURER / SUB VENDOR
2.18.1.	As instructed by BHEL and as per approved FQP, Materials to be procured by the bidder must be approved by BHEL / NTPC. A tentative list of suppliers of some of the items is provided herewith this document. For suppliers other than those mentioned in the list, specific approval of BHEL / NTPC will be required.
2.18.2.	STACK ELEVATOR Stack elevator to be supplied through BHEL / NTPC approved stack elevator manufacturer as furnished below: <ul style="list-style-type: none">1) Alikraft Engineers Pvt Ltd- Savli, Vadodara2) Universal Construction Machinery- Pune Successful bidder can propose name of vendors other than above mentioned vendors but acceptance shall be subject to approval by NTPC. Decision of NTPC in this regard shall be final and binding to Contractor.
2.19.	INSPECTION & JOINT VERIFICATION (AT CONTRACTOR'S WORKS) Prior to dispatch, the materials would be offered by the contractor for joint inspection at the contractor's works as detailed in this tender specification for which the contractor would serve the advance notice of 15 days for inspection call to BHEL.
2.20.	INSPECTION & JOINT VERIFICATION (AT SITE) The contractor shall be intimated within 7 days from the date of receipt of each consignment at site to depute their representative for joint inspection and verification of the equipment / materials received at site. The contractor shall depute their representative within 7 days from receipt of such intimation failing which BHEL shall proceed with the inspection and verification of equipment / materials and BHEL's decision in this regard shall be final and binding to the contractor.
2.21.	QUALITY PLAN The bidder shall furnish the quality assurance plan along with the offer which would be approved by BHEL / Owner.
2.22.	MATERIAL DESPATCH CLEARANCE CERTIFICATE (MDCC):

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	MDCC/Dispatch clearance shall be issued by BHEL / Owner or their authorized representative prior to dispatch. In case the tests are not witnessed by BHEL / Owner / Owner's representative, the test certificates shall be submitted and MDCC/dispatch clearance will be issued thereafter. MRC shall be issued by BHEL / Owner or their authorized representative after the material is received at site in good condition.
2.23.	DEVIATIONS / CLARIFICATIONS The bidder is required to submit with his offer in the relevant 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.
2.24.	DEWATERING Contractor shall ensure at all times that 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.
2.25.	CONSUMABLE
2.25.1.	All consumables, like gas, electrodes, chemicals, lubricants etc. required for the scope of work, shall be arranged by the contractor at his cost from approved brand / make unless otherwise specifically mentioned in the contract.
2.25.2.	All consumables to be used for the job shall have to be approved by NTPC / BHEL prior to use.
2.25.3.	In the event of failure of contractor to bring necessary and sufficient consumables, BHEL may arrange for the same and recover from contractor actual charges plus 5 % overheads. The entire cost towards this along-with overhead shall be paid by the contractor or deducted from the contractor's bills.
2.26.	TEST CERTIFICATES Necessary test certificates of all materials supplied by contractor are to be produced to BHEL prior to use of those materials.
2.27.	IMTE The contractor shall ensure deployment of reliable and calibrated instrument, measuring, and test Equipment (IMTE). The IMTE shall have test calibration certificate from authorized / Govt approved agencies. The contractor shall also keep provision of alternate engagement for such IMTE so that the work does not suffer when a particular IMTE is sent for calibration. Re-testing/ re-calibration shall also be arranged by the contractor at their own cost at regular interval during the period of use as advised by BHEL.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.28.	QUALITY CONTROL & QUALITY ASSURANCE
2.28.1.	INSPECTION & FIELD QUALITY ASSURANCE
2.28.1.1.	Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) & technical instructions as revised from time to time. 'Total Quality' shall be the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall provide the services of quality assurance engineer as per the relevant clauses.
2.28.1.2.	Preparation of quality assurance log sheets and protocols with customer / consultants / statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer's instructions, is within the scope of work / specification. These records shall be submitted to BHEL / customer for approval from time to time.
2.28.1.3.	The protocols between contractor and customer / BHEL shall be made for correctness of foundations, materials, procedures, at each stage of installation, generally as per the requirement of customer / BHEL. This is necessary to ensure elimination of errors and to avoid accumulation and multiplication of errors.
2.28.1.4.	A daily log book (with proper indexing) should be maintained by every supervisor / engineer of contractor, for respective area of work, on the job for detailing and incorporating alignment/ clearance / centering / levelling readings and inspection details of various equipment, etc. This log book shall be always accessible to BHEL engineers. High pressure welding (as applicable under the scope of this contract) details like serial number of weld joints, welders name, date of welding, details of repair, heat treatment etc. will be documented in welding log as per BHEL Engineer's instructions. Record of radiography (as applicable under the scope of this contract) containing details like serial number of weld joints, date of radiography, repairs, if any, re-shots etc shall also be maintained as per BHEL Engineer's instructions. Record of heat treatments (as applicable under the scope of this contract) performed shall be maintained as prescribed by BHEL.
2.28.1.5.	The contractor has to take prior permission / approval before deployment of NDE & Heat Treatment agencies at site as per BHEL document no. PP-QLY-AA-DC-106/01-20. The contractor's employees involved in NDE & Heat treatment job must be qualified & experienced as per the requirement of the above document.
2.28.1.6.	The performance of welders (as applicable under the scope of this contract) will be reviewed from time to time as per the BHEL standards. Welders' performance record shall be furnished periodically for scrutiny of BHEL's Engineer. Currently, BHEL follows online Welder Performance Monitoring System. Contractor shall extend necessary support, as deemed fit by BHEL site-in-charge, regarding data entry into the system. Corrective action as informed by BHEL shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.
2.28.1.7.	Only welders duly authorized by BHEL / customer / consultant after welder qualification test as per ASME Sec-IX / AWS D1.1 (as applicable) shall be engaged on the work. All the

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	welders shall carry identity cards as per the proforma prescribed by BHEL / Customer / Consultant. High Pressure welders and welders of special material viz. C276, Ti, etc., must be trained & tested by experts from BHEL-WRI/ other units. Necessary infrastructure for welder training & testing, as per BHEL's instruction, to be arranged by the contractor without any extra cost to BHEL.
2.28.1.8.	Any re-laying or re-termination of cables / re-erection of instruments / recalibration of instruments etc. required due to contractor's mistake and found at any stage inspection, shall be carried out by the contractor at no extra cost. Repair / rectification procedure to be adopted to make any job acceptable shall be subject to the approval of BHEL. Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next week's inspection plans. Site in-charge of the contractor along with QAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
2.28.1.9.	Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next week's inspection plans. Site in charge of the contractor along with QAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
2.28.2.	REQUIREMENT OF ISO 9001
2.28.2.1.	BHEL: PSER is accredited with ISO 9001 certification and as such this work is subject to various audits to meet ISO 9001 requirements.
2.28.2.2.	<p>The basic philosophy of the Quality Management System under ISO 9001 is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product / procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers / vendors of various products / services contributing in the work are also considered as part of the quality management system.</p> <p>As such the contractor is expected not only to conform to the quality management system of BHEL but also it is desirable that they themselves are accredited under any quality management system standard.</p>
2.28.2.3.	BHEL reserves the right to carry out quarterly quality audits 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 & surveillance.
2.28.2.4.	Quality audits / 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 no way limit the liabilities and responsibilities of the contractor in earning satisfactory performances of equipment / service as per specification.
2.28.3.	MMEs / MMRs
2.28.3.1.	Contractor shall ensure deployment of reliable and calibrated MMEs (Measuring and Monitoring Equipment). The MMEs shall have test / calibration certificates from

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	authorised / Government approved / Accredited agencies traceable to National / International Standards. Retesting / 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 MMEs so that work does not suffer when the particular equipment / instrument is sent for calibration. Also if any MMEs 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 MME and retake the readings at Contractor's cost.
2.28.3.2.	Contractor shall provide all the Measuring Monitoring Equipment (MMEs) required for completion of the work satisfactorily. These MMEs shall be of brand, quality and accuracy specified by BHEL Engineer and should have necessary calibration and other certificates as per the requirement of BHEL Engineer. Decision of BHEL Engineer regarding acceptance or otherwise of the measuring instruments / gauges / tools for the work under this specification, is final and binding on the contractor. BHEL shall give an indicative list of MMEs required for this work elsewhere in this contract and to be made available by the contractor. The list will be reviewed by BHEL site as per the requirement of approved FQPs and the contractor shall meet any augmentation needed wherever required.
2.28.3.3.	It is the responsibility of the contractor to prove the accuracy of the testing / measuring / calibrating equipment brought by him based on the periodicity of calibration as called for in the BHEL's quality assurance standards/BHEL Engineer's instructions.
2.28.3.4.	Re-work necessitated on account of use of invalid MMEs shall be entirely to the contractor's account. He shall be responsible to take all corrective actions, including resource augmentation if any, as specified by BHEL to make-up for the loss of time.
2.28.3.5.	In the courses of erection, it may become necessary to carry repeated checks of the work with instruments recently calibrated, re-calibrated. BHEL may counter / finally check the measurements with their own MMEs. Contractor shall render all assistance in conduct of such counter/ final measurements.
2.28.4.	INSPECTION BY TS / FES / QA ENGINEERS OF BHEL UNITS / ENGINEERING CENTRES
2.28.4.1.	Apart from day-to-day inspection by BHEL Engineers stationed at Site and Customer's Engineers, stage inspection of equipment under erection and commissioning at various stages may also be conducted by teams of Engineers from Field Engineering Services of BHEL's Manufacturing Units, Quality Assurance teams from Field Quality Assurance, Unit/Factory Quality Assurance and Commissioning Engineers from Technical Services etc. Contractor shall arrange all labour, tools and tackles etc along with proper access for such stage inspections free of cost.
2.28.4.2.	Any modifications suggested by BHEL FES and QA Engineers' team shall be carried out. Claims of contractor, if any, shall be dealt as per applicable clause of the contract, and provided such modifications have not arisen for reasons attributable to the contractor.
2.28.5.	CONFORMANCE TO THE STATUTORY REQUIREMENTS (AS APPLICABLE UNDER THE SCOPE OF THE CONTRACT)
2.28.5.1.	The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	<p>with applicable regulations. The work-related statutory inspections, though not limited to, are as under:</p> <ol style="list-style-type: none">1) Inspectorate of Steam Boilers and Smoke Nuisance2) Electrical Inspector3) Factory Inspector, Labour Commissioner, PF Commissioner and other authorities connected to this project work. <p>The scope includes getting the approvals from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per BHEL Engineer's instructions, arranging materials for ground inspection, taking rub outs for stamping of the pressure parts / pipes to be offered for inspection, submitting co-related inspection reports, documents, radiographs etc and following up the matter with them. Contractor shall also make all arrangements for offering the Products / Systems for inspection at location, as applicable, to the concerned authority</p>
2.28.5.2.	<p>Contractor should be qualified to execute pressure parts & piping work coming under the purview of IBR or Competent Inspecting Authority, for which he should register himself with CIB of state concerned / Competent Inspector. Contractor also should be aware of the latest Boiler regulations and Electricity Act, including the amendments thereof, as applicable under the scope of this contract.</p>
2.28.5.3.	<p>Contractor shall comply with 'Qualification Tests for welders engaged in welding of Boilers and Steam Pipes under Construction, Erection and Fabrication at Site in India and in repairing Boilers and steam pipes by welding' in line with Chapter XIII of Indian Boiler Regulations- 1950, for testing his welders / men / workers, including all associated fees, procedures, required instruments and equipment and their calibration thereof. It shall be contractor's responsibility to obtain approval of Statutory Authorities, wherever applicable, for the conducting of any work which comes under the purview of these authorities, at his cost.</p>
2.28.5.4.	<p>The following fees shall be excluded from scope of Contractor:</p> <ol style="list-style-type: none">1. Registration Fee as per Regulation 385 of Chapter IX of Indian Boiler Regulations-1950 or Registration Fee as per prevailing statutory boiler regulations.2. Fees for inspection of Boiler at the site of Construction as per Regulation 395 A, sl no 4 of Chapter IX of Indian Boiler Regulations- 1950. However, all other fees like visit fees charged by the Boiler Inspector and other arrangements for his visit or visits till satisfactory completion of work, shall be included in scope of Contractor.
2.28.6.	STORAGE & PRESERVATION OF WELDING ELECTRODES & OTHER BHEL-ISSUED MATERIAL
2.28.6.1.	<p>The contractor shall be responsible for storage & preservation of welding electrodes & other BHEL-issued materials as per BHEL Storage & Preservation Guidelines / Instructions.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.28.7.	PENALTIES ON VENDORS / SUB-CONTRACTORS AGAINST NON-COMPLIANCE OF QUALITY NORMS				
	Sl. No.	Nature of Non-compliance	Penalty for Domestic Project	Penalty for Export Project	Remarks
	GENERAL				
	2.28.7.1.	Unavailability of QAE deployment schedule (duly approved by BHEL Site) matching with manpower requirement of approved L2 schedule	0.10%	0.10%	Against each RA bill
	2.28.7.2.	Unavailability of required number of QAE with proper experience & NDT certification as per the requirement of the Contract	Rs. 1,000.00	\$16.00	Per person per day
	2.28.7.3.	Not attending quality meeting of BHEL by nominated member of vendor / sub-contractor	Rs. 2,000.00	\$32.00	Per meeting
	CALIBRATION				
	2.28.7.4.	Use of MMEs without valid calibration certificate	Rs. 1,000.00	\$16.00	Per equipment per instance
	2.28.7.5.	Use of NDT equipment, welding equipment without having valid calibration certificate / condition not as per requirement	Rs. 1,000.00	\$16.00	Per equipment per instance
	WELDING & NDT				
	2.28.7.6.	Unqualified welders carrying out welding / tack welding	Rs. 1,000.00	\$16.00	Per welder per instance. (Gatepass of the person shall be withheld)
	2.28.7.7.	Not using portable oven for welding consumables	Rs. 500.00	\$8.00	Per welder per instance. (The consumables in the oven shall be confiscated)

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.28.7.8.	Not using electrodes pre-baked in baking oven	Rs. 500.00	\$8.00	Per instance. (The subject consumables shall be confiscated)
2.28.7.9.	Not using welding consumables of approved make & not using correct type of electrode as per approved EWS / Drawing / WPS	Rs. 1,000.00	\$16.00	Per instance. (The subject consumables shall be confiscated)
2.28.7.10.	Non-removal of welding slag and spatters after welding	Rs. 500.00	\$8.00	Per joint
2.28.7.11.	Not using NDT equipment as prescribed in the manual / FQP / guidelines / Contract	Rs. 1,000.00	\$16.00	Per equipment per instance
2.28.7.12.	Welder doing welding without valid job card	Rs. 500.00	\$8.00	Per instance
2.28.7.13.	Discrepancy observed in the weld joints identified by BHEL / Customer for RT vs RT film offered	Rs. 2,000.00	\$32.00	per joint
MATERIAL MANAGEMENT				
2.28.7.14.	Non-maintenance of grid pillar marking	Rs. 200.00	\$3.00	Per location week
2.28.7.15.	Mismatch of location of material in store area w.r.t. location mentioned in stock register	Rs. 500.00	\$8.00	Per instance
2.28.7.16.	Non-compliance of Preservation of material as per storage & preservation manuals	Rs. 1,000.00	\$16.00	Per equipment
2.28.7.17.	Not offering received material for verification within stipulated time as per contract	Rs. 500.00	\$8.00	Per instance
PAINTING & ALLIED WORKS				
2.28.7.18.	Not using primer / paints of approved make and as per Specifications	Rs. 1,000.00	\$16.00	Per instance
2.28.7.19.	Painting without proper surface preparation as per approved schedule / drawing / FQP	Rs. 500.00	\$8.00	Per instance
PROTOCOLS & LOG SHEETS				

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	2.28.7.20.	Delay in preparation of Protocols / Logsheets as per approved FQP within 3 days of completion of checks	Rs. 200.00	\$3.00	Per protocol per day delay
	INSPECTION OF BOUGHT-OUT ITEMS / CONSUMABLES				
	2.28.7.21.	Delay in offering inspection of Bought-out Items / Consumables / Aggregates (for items which need site inspection as per approved QP) within 3 days of receipt of material at site	1% of the item value of the LOT	1% of the item value of the LOT	per item per day delay after receipt of material
	2.28.7.22.	Delay in submission of required documents (viz. Invoice, Inspection Release Note, COC, MDCC, MTC as the case may be) of Bought-out Items (shop inspection items / consumables) with in 3 days of receipt of material at site.	1% of the item value of the LOT	1% of the item value of the LOT	per item per day delay after receipt of material
	NOTE: Any non-conformity attributable to vendor / sub-contractor due to which dismantling / rework done, shall be penalized at a rate mentioned above or cost to BHEL, whichever is higher.				
2.29.	OCCUPATIONAL HEALTH, SAFETY & ENVIRONMENT MANAGEMENT				
	Applicable HSE norms shall be as per HSE Doc. No.: HSEP14 Rev. 02, Dec. 21, 2022 .				
2.30.	PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT				
	To meet the need of construction management at site, contractor shall provide the following services within quoted/ accepted rates.				
2.30.1.	PLANNING & MONITORING				
2.30.1.1.	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 sub-system / component 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.				

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.30.1.2.	The bidder shall also prepare progress report indicating progress on key activities, management summary for critical activities, 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.						
2.30.1.3.	<p>The bidder will have to install 2 no PC (multimedia PC work station Pentium- core-i5-650, 3.2 GHZ or above, 500 GB HDD, 6 GB RAM, 100/1000 MBPS LAN card) of HP/ DELL / HCL /LENEVO or equivalent make with window 10 (professional) 64 bit (with roll back to 32 bit O/S and required software like MS Office 2010 Professional or higher, AutoCAD 2014 or higher, PageMaker (7.0 etc), ADOBE PDF CREATOR with one no laser jet printer compatible for A4/A3 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.</p> <p>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.</p> <p>The contractor shall also provide 1 (one) no computer operator and 1 (one) number 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</p> <p>Persons so deployed shall have to work in extended hours whenever required. Workmen provided as per the above provisions shall be fully trained and experienced in the nature of work for which they are deployed.</p> <p>However, if BHEL does not utilize the man months as per above provision, fully or partly; recovery at the rate of the prevailing minimum wages at Kahalgaon along with statutory expenses i.e. PF, ESI, bonus etc. (as applicable) for the categories given plus 10% will be made from the final bill of the contractor.</p> <p>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 prorata basis, from contractor's RA bill or any other dues.</p> <table><tr><td>2.30.1.3.1.</td><td>@ Rs 20,000/- (Twenty thousand)/ month for each computer operator. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.</td></tr><tr><td>2.30.1.3.2.</td><td>@ Rs 15,000/- (Fifteen thousand) / month for each service staff. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.</td></tr><tr><td>2.30.1.3.3.</td><td>@ Rs 15,000/- (Fifteen thousand)/ month for each set of computer & printer. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.</td></tr></table>	2.30.1.3.1.	@ Rs 20,000/- (Twenty thousand)/ month for each computer operator. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.	2.30.1.3.2.	@ Rs 15,000/- (Fifteen thousand) / month for each service staff. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.	2.30.1.3.3.	@ Rs 15,000/- (Fifteen thousand)/ month for each set of computer & printer. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.30.1.4.	In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder and if the services of computer operator(Skilled) & Service staff(unskilled) are being used by BHEL then successful bidder shall be reimbursed by minimum wages with statutory benefits +15% minimum.
2.30.1.5.	The contractor's site office must have facilities of communications like Computer with all facilities, E-mail, and telephone with STD facility within a month from LOI.
2.30.1.6.	A list contain supply of computers & printers with their workability status and details of supply of computer operators & service staff with their payment details will be quarterly submitted by the successful bidder to BHEL.
2.30.2.	PROGRESS REPORTING
2.30.2.1.	The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases / electrodes) report and other reports as per pro-forma considered necessary by the 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.
2.30.2.2.	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.
2.30.2.3.	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.
2.30.2.4.	Weekly progress review meetings will be held at site during which actual progress 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.
2.30.2.5.	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.
2.30.2.6.	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 through email only. However, if required, bidder to submit hard copies of photographs as and when required in line with instruction by BHEL site. In case of failure in providing such soft and/or hard copies photographs, an amount of Rs. 1,000/- per instance shall be deducted from contractor's RA bill.
2.30.2.7.	Successful bidder has to provide for electronic / computerized storing and reproduction/ printing/ plotting of various data, log sheets, protocols, measurements etc. These may be stored in pen drive (as per requirement) and handed over to BHEL as per requirement.
2.30.3.	SITE ORGANIZATION
2.30.4.	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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	organization chart (showing the name of SITE-IN-CHARGE) with individual bio-data indicating various levels of experts to be posted 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 of LOI.	
2.30.5.	Following Tentative Manpower with power plant construction background to be deployed at site by the successful vendor for their day to day supervision etc.as directed.	
2.30.5.1.	Qualified safety officer (exclusive for safety supervision)	One no. officer (from start of work) One no. assistant (from start of work)
2.30.5.2.	Site supervising staff for Civil work	1 engineer and 2 nos. supervisors. However, during shell construction work, minimum 2 no. engineers and 4 nos. supervisors to be deployed for working in day and night shift.
2.30.5.3.	Site supervising staff for Structural work	One no. engineer and Minimum 1 nos. supervisors.
2.30.5.4.	Engineer for quality inspection.	Two nos. (one no. from start of work, 2nd as per site requirement)
2.30.5.5.	Material management, site enabling	One no.
2.30.5.6.	Engineer for Civil Laboratory	One no.
2.30.5.7.	Deputation of above man-power shall be jointly decided and agreed at site in line with construction schedule.	
2.30.5.8.	Engineer / supervisor for other functions like store & purchase, material management, planning, finance, administration, etc are to be provided as per site requirement and not considered above.	
2.30.5.9.	Induction of further manpower regarding site supervisor & site engineer will be decided by BHEL at site as per requirement without any financial implication.	
2.30.5.10.	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.	
2.30.5.11.	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.	
2.30.5.12.	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.	
2.30.5.13.	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	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	by BHEL within four weeks of the date of finalization of award of work/ placement of LOI.
2.30.6.	CONSTRUCTION MANAGEMENT
2.30.6.1.	Based on the approved program, the contractor shall submit a program of construction / erection / commissioning for the implementation. These programs would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detail monitoring. The three-monthly rolling program with the first month's program being tentative based on the site condition would be prepared based on these programs. The contractor shall also be involved along with NTPC / BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets.
2.30.6.2.	The program would be jointly finalized by the site in-charge of the contractor with BHEL / NTPC's project coordinator as well as the site-planning representative. The erection program will also identify sequential events matching financial turnover.
2.30.6.3.	Theses network / Program must confirm to the overall requirement of the project schedule. The bidder should also ensure monitoring of these activities at least on weekly basis to start with and on daily basis whenever required by BHEL.
2.30.6.4.	The contractor is liable to furnish all documentary evidences towards payment of Works Contract Tax as and when required by BHEL.
2.30.7.	CONSTRUCTION OF TEMPORARY OFFICE, STORES ETC
2.30.7.1.	The contractor shall arrange at his own cost cleaning of area allotted, construction of his temporary office, stores, cement godown etc. and also the watch and ward of all the above. Materials required for the same shall be provided by contractor at his own cost.
2.30.7.2.	BHEL contemplates to provide fabrication yard with in approx. 1000 Mtr from chimney. However, during execution, based on actual site conditions, requirement and layout and approaches, the above may change suitably.
2.30.7.3.	The contractor shall ensure storage of adhesives & primers required for Borosilicate lining work in controlled atmosphere. For this purpose, contractor has to arrange suitable store at his own cost.
2.31.	METHOD OF MEASUREMENT
2.31.1.1.	Mode of measurement shall be as per relevant clauses of technical specification of this tender. In case the same is not available the relevant IS 1200 in conjunction of IS code 3385 shall be adopted. In case the same is also not available, the standard procedure adopted in CPWD shall be adopted. In case the same is also not available in CPWD, the measurement of the work done will be based on the mutual agreement between BHEL and contractor. In all the above cases, the interpretation of BHEL will be final and binding to the contractor.
2.32.	EXTRA/ ADDITIONAL ITEMS OF WORK It shall be as per relevant clauses of GCC.
2.33.	DESIGN OFFICE AND FABRICATION DRAWING
2.33.1.1.	Based on design drawings of structures, to be issued to the contractor from time to time by BHEL, contractor will prepare & submit within 15 days of receipt, the detail fabrication / shop drawing including tabulated form of bill of materials (BOM), joint calculations, for comments / approval of BHEL at the office of BHEL / PEM, Noida. BHEL reserves the right to assess the capability of the agency to be deployed by contractor for

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

	preparation of such fabrication drawing, and prior approval from BHEL Engineering office at Noida, is required for appointment of such agency.
2.33.1.2.	Since time is the essence of the contract, the contractor must indicate the location of their design office where from such detailed activities will be made operative. It is preferred that the contractor have establishment / liaison office at Delhi / Noida with a coordinator for better co-ordination with BHEL-PEM.
2.33.1.3.	Contractor shall submit progress report pertaining to fabrication drawing, by 7 th of each month, drawing-wise, section-wise cumulative bill of materials for which engineering drawing has been issued to them and status of fabrication drawing.
2.33.1.4.	Based on specification vendor has to design the electrical drawing & aviation lights for chimney within the time schedule mentioned in relevant clause. Based on approval from BHEL / NTPC, vendor has to procure & supply the materials at site.
2.33.1.5.	As per specification, vendor has to submit the design, MQP & drawing for elevator. On approval of the same, vendor has to take further action for supplying the Elevator to site.
2.34.	FABRICATION
2.34.1.	All the fabrication of structural steel items (except work done at qualified shop(s) outside the project premises as per BOQ cum Price schedule) shall be done in fabrication yard inside project premises. Quality plan for structural works will be issued during execution stage upon approval of customer . Bidders to note that all fasteners like MS / HT / HSFG bolts, nuts, lock nuts, washers etc shall be supplied by bidder as per technical specification / drawings.
2.34.2.	Bidder, at his own cost, shall supply electrodes required for fabrication, erection of structural steel as per specification and approval of BHEL.
2.34.3.	Above mentioned clauses pertaining to consumption and wastage of structural steel applies to those materials issued by BHEL for site fabrication.
2.35.	INSURANCE
2.35.1.	BHEL shall arrange comprehensive MCE (marine cum erection) Insurance Policy for total project supply & services including balance of plant package covering transit risks & loss, destruction or damage during handling at Site, Storage, civil works ,erection, testing and commissioning up to trial operation completion of unit including theft, sabotage, fire, lightning and other natural calamities.
2.35.2.	Contractor shall report to BHEL in writing any damages to equipment/components on receipt, storing, and during withdrawal of the materials from stores, in transit to site and unloading at place of work and during erection and commissioning till trial operation completion including handing over. The above report shall be as prescribed by BHEL site management. Any consequential loss arising out of non-compliance of this stipulation will be borne by contractor.
2.35.3.	The contractor will take necessary precautions/ due care to protect the material at Project site, while in his custody from any damage/ loss till the same is handed over to BHEL / customer at Project site. For lodging/ processing of insurance claim the contractor will submit necessary documents. BHEL will reserve the right to recover the loss from the contractor as detailed below in case the damage/loss is due to negligence/ carelessness on the part of the contractor. In case of theft of material under contractor's custody, the same shall be reported to police by the contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL / customer for taking up with insurance. However, this will not relieve the contractor of his contractual obligation for the materials in his custody.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – II: SCOPE OF WORK

2.35.4.	In case the damage/loss/theft of materials are attributable to negligence/failure in discharging the duties and obligations of the contractor, the expenses incurred for repair/replacement of such components in excess of the amount realized from the underwriters, limited to Normal Excess (Deductible Franchise) shall be recovered from the contractor.
2.35.5.	Other conditions of Insurance shall be as per relevant clause of GCC/SCC.
2.36.	OTHER TERMS
2.36.1.	While bidder's scope include deployment of all resources, like T&P, materials, consumables, manpower including supervision etc. for proper completion of the subject job and no sub-contracting for execution of the job is allowed by BHEL, depending on project's requirement and on prior acceptance of BHEL, bidder may associate agencies for deployment of skilled / unskilled manpower only for site execution. Bidder should arrange all resources, like T&P, materials, consumables, supervision etc. directly for the subject job.
2.36.2.	Drawing showing enough details for the construction as per the specification shall be furnished to the contractor in a phased manner as far as possible.
2.36.3.	The records / log-books / registers like Site Order Book, Hindrance Register, RMC / Steel Supply and Consumption Register, etc. are to be maintained properly by the vendor duly signed by BHEL representative.
2.36.4.	All other term & conditions of this specification shall be governed by the pertinent provisions of SCC & GCC as applicable.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

3.0	FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL
3.1.	LAND
3.1.1.	Availability of land within plant boundary is very limited and the contractor has to plan & use the existing land considering the use of land by other contractors and the storage of plant machineries and materials. The existing land shall be shared by all erection's agencies. The same will be reviewed by BHEL and allotted to the extent available/ considered necessary free of cost. Contractor shall develop these areas for their site office, their own stores etc. Bidder must visit site to assess site condition, prior to quoting.
3.1.2.	Levelled area for storage area for BHEL's material shall be provided as per availability free of cost.
3.1.3.	Land for labour colony shall be arranged by successful bidder at their own. The contractor shall construct labour colony / hutment as per his requirements after obtaining approval of formalities from statutory body. Further, contractor must ensure minimum HSE norms and hygienic sanitary conditions in his labour colony.
3.1.4.	The contractor will be responsible for handing back all lands, as handed over to him by BHEL/NTPC.
3.2.	WATER
3.2.1.	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. However, drawl of construction/ potable water from the bore-well shall be permitted if found suitable. Any statutory clearance required shall be obtained by the contractor. Assistance, if required shall be provided by the BHEL/NTPC.
3.3.	ELECTRICITY
3.3.1.	BHEL shall provide construction power on chargeable basis at 415V level at one point. The charges only for the actual energy consumed by the Contractor shall be recovered by the Employer based on prevalent rate of DISCOM for type of connection (HT/LT). Contractor has to make their own distribution arrangement to draw electricity. Overall area illumination will be provided by BHEL. However, for night working contractor should arrange illumination as and when required by them. 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.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

3.3.2.	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.
3.3.3.	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.
3.3.4.	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.
3.3.5.	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.
3.3.6.	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.
3.3.7.	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 NTPC, same shall be distributed proportionately among all sub-contractors working during the respective calendar month.
3.3.8.	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.
3.3.9.	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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

	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.
3.3.10.	Contractor shall make arrangement of electricity of their own for labour colony.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

4.0	TOOLS & PLANTS (TO BE PROVIDED BY CONTRACTOR)		
4.1.	Tentative list of T&P to be deployed by contractor for successful completion of work is detailed below.		
4.2.	It may be noted that the list is not exhaustive and is only for 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 & handing equipments 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 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 after order to BHEL / SITE.		
4.3.	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 arrange the same including mobilization, demobilization, hiring charge, fuel charge etc of same from any of BHEL site/ other agency & charges as applicable shall be deducted from contractor's RA bill. BHEL also reserve for suitable deduction towards non-deployment of T&P as per project requirement in line with BHEL's rate of T&P charges available at BHEL/site through corporate circular time to time. Decision of BHEL in this regard will be final & binding on contractor.		
4.4.	Following Major T&Ps to be arranged by contractor within the time as indicated:		
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

	4.4.7.	Welding Machine	As per requirement
	4.4.8.	Motorized MS plate bending machine along with angle bending device – 1 no.	As per requirement
	4.4.9.	Transit Mixer (5 / 6 Cum capacity)	1 nos within 45 days Balance as per requirement
	4.4.10.	Concrete Pump (20 cum/ hr min capacity)	As per requirement
	4.4.11.	3 Nos Self Priming Dewatering Pump 5 HP (diesel / electric)	As per site requirement
	4.4.12.	2 Nos Multi stage high lift water Pump (for curing) (lifting height shall be minimum 190 meter).	1 nos within 60 days 1 nos within 75 days
	4.4.13.	2 Nos Reinforcement Bending Machine	1 nos within 30 days Balance as per requirement
	4.4.14.	3 Nos Reinforcement Cutting Machine	2 nos within 30 days Balance as per requirement
	4.4.15.	1 No Compression Testing Machine (200 T Cap)	Within 30 days.
	4.4.16.	Power Winch – 3 T	As per requirement
	4.4.17.	Power Winch – 5 T	As per requirement
	4.4.18.	Power Winch – 10 T	As per requirement
	4.4.19.	1 No Total Station	Within 30 days.
	4.4.20.	2 Nos Auto Level & Staff	01 no Within 30 days.
	4.4.21.	DG set (suitable capacity as per requirement)	01 no Within 30 days.
	4.4.22.	Concrete Cube Moulds	As per requirement
	4.4.23.	Slip / Inter form equipment set including required winches for man & material lifting, hydraulic spare pump, minimum 10% spare	Mobilization to start within 20 days.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

	jack, jack rods, epoxy painted MS shutter plate, wooden planks, materials and passenger hoist with safety block (safety devices), safety ropes etc complete - 1 set	
4.4.24.	Strand Jack / winches with safety device lifting capacity 15 T	As per requirement
4.4.25.	Hanging platforms with safety device	As per requirement
4.4.26.	1 Nos Trailer – 20T,	Within 30 days.
4.4.27.	1 No. Drinking Water Tank – 1000 Lit.	Within 30 days.
4.4.28.	1 No. Ultra-Sonography Testing Machine for structural work.	As per requirement
4.4.29.	1 No. Radiography Source.	As per requirement
4.4.30.	Radio set (VHF/UHF.)	As per requirement.
4.4.31.	1 Nos - 30 Cum/Hr capacity of Automatic Batching Plant with Printing facility with required Silo for storing of Cement to be commissioned at Site.	Within 30 Days
4.4.32.	Civil laboratory equipments as per list attached in ANNEX 'A'	Within 30 days.
4.4.33.	Portable fire extinguishers as below: Soda acid – 4 sets. Dry chemical powder – 4 sets CO2 – 2 sets. Water & sand bucket (4 buckets in one stand) – 3 sets. Fire hose with nozzle (50 M length) – 2 sets.	Within 45 days.
4.4.34.	Necessary Tilting structural arrangement with rail for movement /rotation of flue can from outside RCC shell to inside RCC Shell	As per site requirement (just after completion of RCC Shell)
4.4.35.	Moving platform arrangement/Suspended rope platform with safety device for working inside flue can. Rope Suspended Annular Circular Platform for Boro-Silicate application with minimum	As per site requirement (just after completion of flue can erection)

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

	4no. rope climbing machine and other accessories and having self-operating facility from the platform with Safe Working Load of 8MT or equivalent reputed manufacturer make to be approved by BHEL-1 set.	
4.4.36.	Material cum passenger lift (minimum 1 Ton capacity) having automatic safety lock. Each Material cum passenger lift operated through. minimum 3MT double drum winch capacity-2 set	As per site requirement (Before completion of flue can erection)
4.5.	T&P shown in the above-mentioned list and the mobilization schedule is tentative requirement considering parallel working. However, mobilization schedule modification as well as no. of T&Ps as mutually agreed at site for major T&Ps, have to be adhered to. Numbers/ time of requirement will be reviewed time to time at site and contractor will provide required T&P/ equipment's to ensure completion of entire work within schedule/target date of completion without any additional financial implication to BHEL. Vendor shall give advance	
4.6.	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.	
4.7.	In the event of contractor failing to arrange the required tools, plants, machineries, equipment, material or non-availability of the same owing to breakdown, BHEL will make alternative arrangement and recover from contractor actual charges plus 5 % overheads.	
4.8.	In case the BHEL provides any T&P which is owned by BHEL, hire charges (as per BHEL norms) will be recovered from the contractor as per the prevailing BHEL corporate hire charges. Recovery charges shall be @“hire charges applicable to contractor working for BHEL” will apply	
4.9.	CIVIL LABORATORY Contractor shall establish and maintain civil laboratory Room with necessary equipment for conducting relevant site tests, as required. Tentative list of Lab equipments to be deployed / arranged by the contractor are given in Annexure-A.	
4.10.	TEST CERTIFICATE FOR T&P All T&P, lifting tackles and pulling devices to be deployed by the contractor must bear valid / latest test certificates for their suitability, and the documents shall be preserved at site.	
4.11.	T&P TO BE PROVIDED BY BHEL No T&P shall be provided by BHEL.	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

ANNEXURE- A				
TENTATIVE LIST OF EQUIPMENTS FOR CIVIL SITE LABORATORY				
A	CONCRETE TESTING EQUIPMENT			
SL NO.	NAME OF TEST	NAME OF EQUIPMENT	SIZE OF EQUIPMENT	IS REF.
1	Concrete Compressive test	Digital Compressive Testing Machine with 2000 KN capacity.	2000KN capacity	IS 2505
2	Concrete Cube casting	Concrete Cube Mould	150x150x150mm, minimum 50 sets desired considering Raft/Shell concreting activity. & 70.6 x 70.6 x 70.6 mm, 05 Nos. minimum	IS 10086
3	Workability of concrete	Slump cone	Standard, atleast 04 nos	IS 456
4	Electric mortar mixer	0.25 CUM capacity.	01 no	
B	Soil Testing Equipment (Levelling & Grading)			
1	Liquid limit test	Liquid limit apparatus	Standard	IS 2720
2	Core Cutter test	core cutter apparatus	Rammer, 4 nos of standard core cutter mould, dolly	IS 2720
3	Proctor density test	Std proctor Compaction apparatus	Standard	IS 2720
4	Moisture Content	Rapid moisture meter	Standard, atleast 04 nos	IS 2720
C	Process Control Accessories			
1	Hot air oven	Temperature range 50° C to 300° C	600x600x600mm (min. size)	
2	Electronic balance	1 no.	1Kg x 0.001g	
3	Physical balance	5 kg capacity	Weights upto 5 kg	
4	Thermometer	Temperature range 0° C to 150° C	Digital	
5	GI tray	03 nos	600x450x50mm, 450x300x40mm, 300x250x40mm	
6	Measuring jars	2 nos set of each size	100ml, 200ml, 500ml & 1000 ml	
7	Gauging trowlers	2 nos	100mm & 200 mm with wooden handle	
8	Spatula	2 nos each size	100mm & 200 mm with long blade wooden handle	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

9	Stainless steel scoop	2 nos each	1 kg and 2 kg	
10	Digital pH meter	01 nos	.01 mm least count	
11	Digital paint thickness meter for steel	02 nos	500-micron Range	
12	Digital paint thickness meter for masanory/concrete painting measurement	02 nos	150-micron range	
D	<u>Other Lab Equipments</u>			
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	Abrasion value test	Los Angeles Abrasion testing machine	Standard	IS 2386
3	Aggregate Impact value test	Aggregate Impact value testing machine.	Standard	IS 9377
4	Aggregate crushing value test	Crushing value apparatus	Standard	IS 2386
5	Flakiness index	Thickness gauge for measuring flakiness index.	Standard	IS 2386
6	Elongation Index	Elongation gauge	Standard	IS 2386
7	Bulk density, voids and bulking apparatus	Measuring cylinders	3, 5,10 & 15 liters cylinders	
8	Specific gravity of aggregates	Pycnometer	Standard, at least 02 nos	IS 383
9	Cement mortor vibration	Motorised vibration machine for cement cube casting	Standard	IS 4031
10	Course aggregate Sieve analysis (Ready mix 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	IS 383

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

			mm, 10 mm, 4.75 mm, Pan and cover (2 Sets)	
11	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, 75 micron, 75 micron, Pan and cover (2 Sets)	IS 383
12	Seive Shaker	Motorised Sieve shaker	Mfg. Catalogue	
13	Silt content check	Sand silt content beaker	Standard	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – V: T&PS AND MMES TO BE PROVIDED BY BHEL

5.0	<p>LIST OF T&P TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS:</p> <p>BHEL shall not provide any T&Ps for this scope of work. All T&Ps required for handling of items / material to be arranged by bidder.</p>
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

6.0	Time Schedule and Mobilization:																		
6.1.	INITIAL MOBILIZATION: After receipt of LOI, Contractor shall discuss with Project Manager / Construction Manager regarding initial mobilization within 15 days of issue of letter of intent. Contractor shall mobilize necessary resources as per the directive of Project Manager / Construction Manager and in line with T&P mobilization schedule mentioned elsewhere. Entire work shall be carried out in accordance with the broad construction / Milestone schedule, within the stipulated completion period. Within 30 days of LOI, 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.																		
6.2.	START DATE / ZERO DATE The Actual Date of Start of work (Zero date) shall be 15 days from the date of intimation by site construction manager or date of handing over of site to contractor, whichever is later and shall be certified by the BHEL Engineer.																		
6.3.	Schedule of Completion: The entire work under this scope shall be successfully completed within 12 (Twelve) months from the date of Start of work. Mobilisation start after intimation by Construction Manager BHEL, Kahalgaon Site <table><tr><th>Sl. No.</th><th>Activity</th><th>Completion time from Zero date Unit-1&2</th></tr><tr><td>1</td><td>Completion of raft casting</td><td>NA</td></tr><tr><td>2</td><td>Completion of Slip-Form Assembly & Erection and start of RCC shell casting with Slip-Form</td><td>02 months</td></tr><tr><td>3</td><td>Shell concreting (100% to be completed) (M1)</td><td>06 months</td></tr><tr><td>4</td><td>Completion of flue can erection (M2)</td><td>10 months</td></tr><tr><td>5</td><td>Completion of installation of borosilicate lining and balance Misc. & finishing works in all respect.</td><td>12 months</td></tr></table>	Sl. No.	Activity	Completion time from Zero date Unit-1&2	1	Completion of raft casting	NA	2	Completion of Slip-Form Assembly & Erection and start of RCC shell casting with Slip-Form	02 months	3	Shell concreting (100% to be completed) (M1)	06 months	4	Completion of flue can erection (M2)	10 months	5	Completion of installation of borosilicate lining and balance Misc. & finishing works in all respect.	12 months
Sl. No.	Activity	Completion time from Zero date Unit-1&2																	
1	Completion of raft casting	NA																	
2	Completion of Slip-Form Assembly & Erection and start of RCC shell casting with Slip-Form	02 months																	
3	Shell concreting (100% to be completed) (M1)	06 months																	
4	Completion of flue can erection (M2)	10 months																	
5	Completion of installation of borosilicate lining and balance Misc. & finishing works in all respect.	12 months																	
6.3.1.	Contractor shall submit structural fabrication drawings within 15 days from the release of engineering drawings by BHEL. Vendor to ensure checking of detail drawing and obtaining approval from PEM through the approved agency within 15 days from detail drawing fabrication																		

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

	<p>submission date. Vendor has to ensure availability of approved drawing at site immediately after the approval.</p> <p>List of the agency for structural drawing detailing and checking are attached in Annexure-1. This list is indicative and for tender purpose only. Vendor has to ensure approval of such agency from BHEL-PEM within 45 days from the date of LOI.</p>		
6.3.2.	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.		
6.3.3.	Above schedule is indicative. The contractor shall plan his work in such a manner so as to meet the overall project schedule, in consultation with BHEL/NTPC Engineer. In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule requirements, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL without any extra cost to BHEL.		
6.3.4.	It may be noted that in the event, delay in completion is attributable to the contractor; BHEL will impose LD on the contractor as per clause no. 6.6 and 6.67 of TCC.		
6.3.5.	<p>CERTIFICATE TOWARDS COMPLETION</p> <p>The work under the scope of the contractor shall be deemed to have been completed in all respects only when so certified by CM, BHEL / NTPC. The decision of BHEL in this regard shall be final and binding on the contractor.</p>		
6.4.	<p>MOBILIZATION ADVANCE/ INTEREST BEARING RECOVERABLE ADVANCE</p> <p>Applicable as per GCC</p>		
6.5.	<p>SECURITY DEPOSIT & PERFORMANCE BOND</p> <p>Security deposit shall be applicable as per relevant clause of GCC (Volume-IB).</p>		
6.6.	LIQUIDATED DAMAGE/ PENALTY		
6.6.1.	Penalty for Intermediate Milestones		
6.6.1.1.	Intermediate Milestone	Activity	Completion time from Zero date Unit-1&2
	M1	Shell concreting (100% to be completed)	06 months
	M2	Completion of flue can erection	10 months
M1 and M2 shall be intermediate Milestones for this work.			

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

6.6.1.2.	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.
6.6.1.3.	Incase 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.
6.6.1.4.	Incase 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.
6.6.1.5.	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.
6.6.1.6.	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.
6.6.1.7.	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 intermediate milestones shall be adjusted against LD or released as the case may be.
6.6.1.8.	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 in to recovery.
6.6.1.9.	Note: *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.
6.7.	LIQUIDATED DAMAGE/ PENALTY FOR OVERALL DELAY
6.7.1.	If the contractor fails to maintain the required progress of work which results in delay in the completion of the work as per the contractual completion period, BHEL shall have the right to impose Liquidated Damage/Penalty at the rate of 0. 5% of the contract value, per week of delay or part thereof subject to a maximum of 10% of the contract value. For this purpose, the period of delay shall be the delay attributable to the Contractor for the completion of work as per contract. Contract Value for this purpose, shall be the final executed value exclusive of ORC, Extra Works executed on Man-day rate basis, Supplementary/Additional Items and PVC.
6.8.	GUARANTEE
6.8.1.	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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

	unused stores and materials, tools, plant, equipment, temporary buildings, site office, labor 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 then Engineer at the Contractor's expenses.
6.8.2.	The Engineer shall certify to the contractor the date on which the work is completed and the date thereof for commencement of Guarantee Period.
6.8.3.	Guarantee period shall be 12 months from the date of start of guarantee period as per relevant clause of GCC.

ANNEXURE- 1		
LIST OF STRUCTURAL DETAILERS FOR CHIMNEY		
Sl No.	Name of the Agency & Address	Previous Work
1	Prabhoo structure Consulting Engineers, Delhi Ph – 011-26186829	Telangana / Rourkela / Unchahar / North Karanpura 2
2	A E Automation, Chennai Ph - 9789859983	Bhadradi, Chimney - 2
3	Bharat Construction Co., Kolkata / Ranchi / New Delhi Ph - 7857800001	Ennore SEZ
4	ADS Engineering Consultant, Kolkata Ph - 8826778359	Bhadradi, Chimney - 1 / Bokaro / North Karanpura 1&3
5	Ennar Structural Design consultant, Chennai	Korba / Marwa
6	Valtrack System Pvt Ltd., Chennai	North Chennai
7	Progressive Drafting Service, Delhi Ph - 8045132348	Barauni
8	Talent Associates, Delhi	Panipat
Note: The above list is indicative and not exhaustive and is for tender purpose only.		
The list of vendors mentioned hereunder may preferably be considered for the following items. However, in case the bidder proposes to procure items from other suppliers, specific approval may be required to be taken.		
Sl. No.	Item description	Probable vendors
1	CONSTRUCTION CHEMICALS – ADMIXURES, PLASTISIZERSS ETC.	SIKA INDIA LIMITED CICO TECHNOLOGIES LIMITED FOSROC CHEMICALS (I) PVT LTD, BSF
2	PAINT AND PAINTING SYSTEM	BERGER SHALIMAR PAINTS JENSON AND NICHOLSON KANSAI NEROLAC AKZO NOBEL ASIAN PAINTS

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: TIME SCHEDULE

3	MINERAL WOOL FOR THERMAL INSULATION	ROCKWOOL INDIA LIMITED, HYDERABAD ROCKWOOL INDUSTRIES, BHILAI LAPINUS, MALANPUR (MP) MINWOOLRAJANANDGAON LLOYD INSULATION, BHILAI U.P. TWIGA, BULENDSHAHAR
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VII: TERMS OF PAYMENT

7.0	Terms of Payment:
7.1.	Progressive Payment/ Final Payment: The payments for works under the scope of this contract shall be as per clause no 2.6; 2.22; 2.23 of General Conditions of Contract and Volume-IB, Chapter-X of SCC.
7.2.	<p><u>Documents required for RA Bill:</u></p> <ul style="list-style-type: none"> • GST Complied Invoice of the work done as per approved BBU. • WAM -6 for RA Bill. • Jointly signed Measurement sheet. • Power of Attorney before submission of Bill. • Validity of Bank Guarantees as applicable under the contract. • HR/IR compliance documents: <ul style="list-style-type: none"> i. Wages payment sheet as per applicable minimum wages. ii. Proof of PF contribution submission. iii. Proof of ESI/ WC contribution submission iv. Proof of Bonus payment as per Bonus Act if applicable. v. Proof of EL payment if applicable. vi. Any other statutory document if applicable.
7.3.	<p><u>Documents required for Final Bill:</u></p> <p>The final bill is drawn as soon as the entire work is completed. From the final amount due, all amounts already claimed up to the previous running account bill will be deducted. It should be ensured that in the final bill the following additional particulars have been provided:</p> <ul style="list-style-type: none"> • Final Bill in WAM-7 Format. • 'No claim' certificate from the contractor. • Clearance certificates where ever applicable viz. Clearance Certificates from Customer, various Statutory Authorities like Labour department, PF Authorities, Commercial Tax Department etc. • Final Material re-conciliation statement duly approved by BHEL. • Indemnity Bond as per prescribed format. • Deviation statement showing the difference between the actuals and as per the contract. • Final Delay Analysis.
7.4.	SECURED RECOVERABLE ADVANCES:

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VII: TERMS OF PAYMENT

	<p>Interest Free Secured Mobilization Advance as per GCC Clause No. 2.13.1 will be payable under exceptional circumstances on certification of BHEL Construction Manager at Site. Interest Free Mobilization Advance shall be disbursed in specifically mentioned stages of major resource mobilization as specified hereunder:</p> <ol style="list-style-type: none">1. For Installation and Erection of Site Infrastructure by contractor i.e. site office & stores. - 2.0%2. For Mobilization of Batching Plant & Transit Mixer (1 Nos.) - 2.0%3. For Mobilization of Slipform Assembly – 1.0% <p>Note:</p> <ol style="list-style-type: none">1. BHEL Site-CM shall be the deciding authority for assessing the admissibility of advance payment to contractor.2. In case contractor do not fulfil the agreed conditions of payment of 1st mobilization advance, BHEL Construction Manager will have the authority to not allow the 2nd mobilization advance to contractor.
7.5.	<p>OVERRUN COMPENSATION (ORC)</p> <p>Not applicable for this tender.</p>
7.6.	<p>BHEL site, at discretion, may further split up the above percentages and effect payment to suit the site condition, cash flow requirement, according to the progress of work.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VIII: TAXES AND DUTIES

8.0	TAXES & DUTIES
8.1	<p>The contractor shall pay all (save the specific exclusions as enumerated in this clause) taxes, fees, license, charges, deposits, duties, tools, royalty, commissions, other charges, etc. which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes/duties, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.</p> <p>However, provisions regarding GST on output supply (goods/service) and TDS/TCS as per Income Tax Act shall be as per following clauses.</p>
8.2	GST (Goods and Services Tax)
8.2.1	<p>GST as applicable on output supply (goods/services) are excluded from contractor's scope; therefore, contractor's price/rates shall be exclusive of GST. Reimbursement of GST is subject to compliance of following terms and conditions. BHEL shall have the right to deny payment of GST and to recover any loss to BHEL on account of tax, interest, penalty etc. for non-compliance of any of the following condition.</p>
8.2.2	<p>The admissibility of GST, taxes and duties referred in this chapter or elsewhere in the contract shall be limited to direct transactions between BHEL & its Contractor. BHEL shall not consider GST on any transaction other than the direct transaction between BHEL & its Contractor.</p>
8.2.3	<p>Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. Where the GST laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL shall have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.</p>
8.2.4	<p>Contractor has to submit GST registration certificate of the concerned state. Contractor also needs to ensure that the submitted GST registration certificate should be in active status during the entire contract period.</p>
8.2.5	<p>Contractor/Vendor has to issue Invoice/Debit Note/Credit Note indicating HSN/SAC code, Description, Value, Rate, applicable tax and other particulars in compliance with the provisions of relevant GST Act and Rules made thereunder.</p>
8.2.6	<p>Vendor has to submit GST compliant invoice within the due date of invoice as per GST Law. In case of delay, BHEL reserves the right of denial of GST payment if there occurs any hardship to BHEL in claiming the input thereof. In case of goods, vendor has to provide scan copy of invoice & GR/LR/RR to BHEL before movement of goods starts to enable BHEL to meet its GST related compliances. Special care should be taken in case of month end transactions.</p>
8.2.7	<p>Vendor has to ensure that invoice in respect of such services which have been provided/completed on or before end of the month should not bear the date later than last working day of the month in which services are performed.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VIII: TAXES AND DUTIES

8.2.8	<p>Subject to other provisions of the contract, GST amount claimed in the invoice shall be released on fulfilment of all the following conditions by the Contractor: -</p> <ol style="list-style-type: none">Supply of goods and/or services have been received by BHEL.Original Tax Invoice has been submitted to BHEL.Contractor/ Vendor has submitted all the documents required for processing of bill as per contract/ purchase order/ work order.In cases where e-invoicing provision is applicable, vendor/contractor is required to submit invoice in compliance with e-invoicing provisions of GST Act and Rules made thereunder.Contractor has filed all the relevant GST return (e.g. GSTR-1, GSTR-3B, etc.) pertaining to the invoice submitted and submit the proof of such return along with immediate subsequent invoice. In case of final invoice/ bill, contractor has to submit proof of such return within fifteen days from the due date of relevant return.Respective invoice has appeared in BHEL's GSTR - 2A for the month corresponding to the month of invoice and in GSTR-2B of the month in which such invoices has been reported by the contractor along with status of ITC availability as "YES" in GSTR-2B. Alternatively, BG of appropriate value may be furnished which shall be valid at least one month beyond the due date of confirmation of relevant payment of GST on GSTN portal or sufficient security is available to adjust the financial impact in case of any default by the contractor.Contractor has to submit an undertaking confirming the payment of all due GST in respect of invoices pertaining to BHEL.
8.2.9	<p>Any financial loss arises to BHEL on account of failure or delay in submission of any document as per contract/purchase order/work order at the time of submission of Tax invoice to BHEL, shall be deducted from contractor's bill or otherwise as deemed fit.</p>
8.2.10	<p>TDS as applicable under GST law shall be deducted from contractor's bill.</p>
8.2.11	<p>Contractor shall comply with the provisions of e-way bill wherever applicable. Further wherever provisions of GST Act permits, all the e-way bills, road permits etc. required for transportation of goods needs to be arranged by the contractor.</p>
8.2.12	<p>Contractor shall be solely responsible for discharging his GST liability according to the provisions of GST Law and BHEL will not entertain any claim of GST/interest/penalty or any other liability on account of failure of contractor in complying the provisions of GST Law or discharging the GST liability in a manner laid down thereunder.</p>
8.2.13	<p>In case declaration of any invoice is delayed by the vendor in his GST return or any invoice is subsequently amended/alterd/deleted on GSTN portal which results in any adverse financial implication on BHEL, the financial impact thereof including interest/penalty shall be recovered from the Contactor's due payment.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VIII: TAXES AND DUTIES

8.2.14	Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of GST Law by the Contractor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the payments due to the Contactor.
8.2.15	In the event of any ambiguity in GST law with respect to availability of input credit of GST charged on the invoice raised by the contractor or with respect to any other matter having impact on BHEL, BHEL's decision shall be final and binding on the contractor.
8.2.16	<p><u>Variation in Taxes & Duties:</u></p> <p>Any upward variation in GST shall be considered for reimbursement provided supply of goods and services are made within schedule date stipulated in the contract or approved extended schedule for the reason solely attributable to BHEL. However downward variation shall be subject to adjustment as per actual GST applicability.</p> <p>In case the Government imposes any new levy/tax on the output service/goods after price bid opening, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its contactor only and within the contractual delivery period only.</p> <p>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/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of price bid. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.</p>
8.3	<p><u>Income Tax:</u></p> <p>TDS/TCS as applicable under Income Tax Act, 1961 or rules made thereunder shall be deducted/collected from contractor's bill.</p>
8.4	<p><u>BOCW Act & Cess Act</u></p> <p>BOCW Cess is not to be borne by contractor. Refer Annexure-I for BOCW Act & Cess Act.</p>

Annexure-I:

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.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VIII: TAXES AND DUTIES

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.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VIII: TAXES AND DUTIES

8.	<p>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:</p> <ul style="list-style-type: none">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.	<p>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.</p>
10.	<p>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.</p>
11.	<p>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.</p>
12.	<p>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.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

9.0	MATERIAL
9.1.	MATERIAL HANDLING (BHEL ISSUED MATERIAL)
9.1.1.	Materials shall be issued by BHEL based on the weighment basis/linear measurements & sectional weight and list of shop fabricated structures as per MDCC/LR/drawings. 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.
9.1.2.	All materials issued by BHEL 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 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.
9.1.3.	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 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 occurs rendering the same unusable, then such quantity of steel shall be recovered from the interim payment at the penal rate specified in the tender.
9.2.	ISSUE OF MATERIALS
9.2.1.	ISSUE OF CEMENT
9.2.1.1.	Cement as received from the manufacturer/ stockiest will be issued free of cost to the contractor. In case if cement is issued in bags, theoretical weight of each bag of cement for issued purposes will be considered as 50 kg, the contractor shall be accountable for the cement issued to the contractor on this notional weight only. No

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

	claim whatsoever will be entertained because of difference between theoretical and actual weight of the bags of cement.															
9.2.1.2.	In case cement is issued through bulkers being supplied from manufacturer/stockiest; the same shall be emptied in cement silos of batching plant and necessary assistance shall be provided by contractor.															
9.2.1.3.	In case BHEL supplies cement through Bulker, Bidder has to store cement in Silos of Suitable capacities as decided by Engineer in charge. Silos Capacities shall be finalized mutually.															
9.2.1.4.	The empty cement bags duly accounted for against issue shall be the contractor's property and the same shall be disposed as per statutory regulation prevailing in the project.															
9.2.1.5.	No cement will be issued on free basis for making bought out item like Hume pipe, Interlocking Paver block, Fly ash brick or for use in contractor's own enabling work etc. However, cement for mortar for fixing of these items if required will be issued on free basis															
9.2.2.	ISSUE OF STEEL															
9.2.2.1.	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: Weighment basis (Unit-MT) iii. GI Gratings: Weighment Basis (Unit- MT/As Received from manufacturer) iv. MS Rails: Weighment Basis (Unit-MT) v. Shop fabricated structures (Unit- Nos as per list (MDCC/LR/Drawings)															
9.2.2.2.	<p>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 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</p> <table><tr><th>Sr No</th><th>Name of Standard</th><th>Name of Section</th></tr><tr><td>1</td><td>IS: 808-1964</td><td>Beams, Channels and Angles</td></tr><tr><td>2</td><td>IS: 1730-1961</td><td>Plates, Sheets and Strips/Flats</td></tr><tr><td>3</td><td>BS4-1: 1993</td><td>UB/UC sections</td></tr><tr><td>4</td><td>IS: 12778/equivalence with EN-19-57</td><td>For NPB sections</td></tr></table>	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	3	BS4-1: 1993	UB/UC sections	4	IS: 12778/equivalence with EN-19-57	For NPB sections
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

	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 hig
In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding.			
9.2.2.3.	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.		
9.2.2.4.	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.		
9.2.2.5.	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 cement and steel during a month by the third week of the previous month indicating his requirement.		
9.2.2.6.	Bidders shall ensure that no lamination material is taken over by them from BHEL.		
9.2.2.7.	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.		
9.2.3.	ISSUE OF BOROSILICATE GLASS BLOCK		
9.2.3.1.	Borosilicate Glass block shall be issued as received vide challan of the transporter in sqm worked out by multiplication of block sizes by no of block.		
9.2.4.	ADHESIVES / MEMBRANCE		
9.2.4.1.	Shall be issued in Kg / Litre as received in drum		
9.2.5.	PRIMER PAINT		
9.2.5.1.	Shall be issued in Litre as received in drum		
9.2.6.	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 contractor from BHEL stores.		

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

9.2.7.	The contractor shall submit to the engineer, a statement indicating estimated quantity of Borosilicate Glass Blocks, required adhesives / membrane and primer required at least two months in advance.
9.3.	RETURN OF MATERIALS
9.3.1.	RETURN OF CEMENT
9.3.1.1.	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 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.
9.3.2.	RETURN OF STEEL INCLUDING SCRAP
9.3.2.1.	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.
9.3.3.	Scrap and Serviceable Materials:
9.3.3.1.	All structural steel rolled sections 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 rolled sections in length less than 2 M Shall be treated as scrap.
9.3.3.2.	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 .
9.3.3.3.	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.
9.3.4.	BOROSILICATE GLASS BLOCK
9.3.4.1.	All unused Borosilicate blocks shall be taken back by BHEL
9.3.5.	ADHESIVES / MEMBRANCE

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

9.3.5.1.	All unused untampered adhesive / membrane drum shall be taken back by BHEL in Kg as received during issue. Open drum / partially used drum shall not be taken back		
9.3.6.	PRIMER PAINT		
9.3.6.1.	All unused untampered drum containing paint shall be taken back by BHEL in litre as received during issue. Open drum / partially used drum shall not be taken back		
9.4.	MATERIAL CONSUMPTION AND WASTAGE		
9.4.1.	CEMENT CONSUMPTION		
9.4.1.1.	The theoretical consumption of cement shall be based on the following:		
9.4.1.2.	For design mix concrete as per approved design mix.		
9.4.1.3.	For nominal mix concrete work, as per minimum cement as specified or as approved by engineer-in-charge.		
9.4.1.4.	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 DSR-2013 unless otherwise specified in the specifications or the drawing of contract or mutually agreed by engineer-in-charge and the contractor.		
9.4.1.5.	Actual consumption = Issue – Surplus/ unused quantity of cement returned in good condition by the contractor to store. (No sweep cement will be taken back by BHEL).		
9.4.2.	CEMENT WASTAGE		
9.4.2.1.	Allowable wastage: One and half percent (+1.5%) of theoretical consumption of cement.		
9.4.2.2.	For any material issued by BHEL to the contractor free of cost, and which is not accounted for by the contractor to BHEL, then recovery for such material shall be affected 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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

	C-3	Actual consumption beyond one and half percent (+1.5%) of above (C-1).	Penal rate
9.4.3.	REINFORCEMENT STEEL & EARTHING MS ROUND CONSUMPTION		
9.4.3.1.	The theoretical consumption of various diameter of reinforcement and earthing MS round 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.		
9.4.3.2.	Actual consumption = Issue – Surplus.		
9.4.3.3.	Surplus = Un-tampered and unused quantity of steel returned by the contractor to BHEL store along-with relevant documents.		
9.4.3.4.	Wastage = Actual consumption – Theoretical consumption.		
9.4.4.	REINFORCEMENT STEEL & EARTHING MS ROUND WASTAGE		
9.4.4.1.	Allowable wastage : (+3%) of the theoretical consumption shall be considered as allowable wastage.		
9.4.4.2.	Wastage and scrap shall be as per actual weighment basis.		
9.4.4.3.	Sl no	Reinforcement steel & earthing rod 40 mm ms round	Basis of issue & penal recovery
	R-1	Theoretical consumption (without considering wastage and scrap or loss)	Free
	R-2a	Wastage limited to plus three percent (+3%) of aforesaid theoretical consumption (R-1) towards allowable wastage and return to BHEL Store.	Free
	R-2b	Wastage limited to plus three percent (+3%) of aforesaid theoretical consumption (R-1) towards allowable wastage but not returned to BHEL Store.	Penal rate
	R-3	Wastage beyond three percent (+3%) of the theoretical consumption above (R-1).	Penal rate
9.4.5.	STRUCTURAL STEEL CONSUMPTION		
9.4.5.1.	The theoretical consumption of various sections shall be based on approved drawings. Weights shall be calculated considering the sectional weights as per Indian standard as mentioned in relevant clause. No extra shall be payable to		

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

	the contractor for any deviation in weights for the two different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances.		
9.4.5.2.	Actual consumption = Issue – Surplus.		
9.4.5.3.	Surplus = Untampered, unused, uncut quantity of steel returned by the contractor to BHEL store.		
9.4.5.4.	Wastage = Actual consumption – Theoretical consumption.		
9.4.6.	STRUCTURAL STEEL WASTAGE		
9.4.6.1.	Allowable wastage – 4 % (four percent) of the theoretical consumption shall be considered. Wastage is further classified as cut pieces and scrap measured as per actual weighment basis. Invisible wastage (loss of materials due to gas cutting, straightening of edges etc) shall be limited to 0.5 % (zero-point five percent) of theoretical consumption and shall be considered for reconciliation purposes only. But this invisible wastage shall be considered to be included in allowable wastage.		
9.4.6.2.	Sl no	Structural steel materials	Basis of issue & penal recovery
	S-1	Theoretical consumption (without considering any wastage, scrap or loss) as per specification & drg.	Free
	S-2a	Wastage limited to plus three-point five percent (+3.5% excluding invisible wastage) of the aforesaid theoretical consumption (S-1) towards allowable wastage and return to BHEL Store.	Free
	S-2b	Wastage limited to plus three-point five percent (+3.5% excluding invisible wastage) of the aforesaid theoretical consumption (S-1) towards allowable wastage but not returned to BHEL Store.	Penal rate
	S-3	Wastage beyond four percent (4%) of the aforesaid theoretical consumption (S-1).	Penal rate
9.4.6.3.	All wastage reinforcement, MS round (for earthing), structural steel shall be returned to BHEL.		
9.4.7.	BOROSILICATE GLASS BLOCK		
9.4.7.1.	Wastage shall be controlled by Supplier of Borosilicate Glass Lining materials under the supervision of whom the lining work shall be carried out. Bidder to follow the instruction of Supplier. Wastage, even after compliance to instructions of supplier, if any, will not be considered under successful bidder's account. However, if it is		

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

	established during the execution that wastage is due to non-compliances by the successful bidder vis-a-vis instruction of supplier and due to the same BHEL has to procure the additional material then the additional cost with applicable overhead including Taxes & duties shall be recovered from the Successful Bidder.
9.4.8.	ADHESIVES / MEMBRANCE
9.4.8.1.	Wastage shall be controlled by Supplier of Borosilicate Glass Lining materials under the supervision of whom the lining work shall be carried out. Bidder to follow the instruction of Supplier. Wastage, even after compliance to instructions of supplier, if any, will not be considered under successful bidder's account. However, if it is established during the execution that wastage is due to non-compliances by the successful bidder vis-a-vis instruction of supplier and due to the same BHEL has to procure the additional material then the additional cost with applicable overhead including Taxes & duties shall be recovered from the Successful Bidder.
9.4.9.	PRIMER PAINT
9.4.9.1.	Wastage shall be controlled by Supplier of Borosilicate Glass Lining materials under the supervision of whom the lining work shall be carried out. Bidder to follow the instruction of Supplier. Wastage, even after compliance to instructions of supplier, if any, will not be considered under successful bidder's account. However, if it is established during the execution that wastage is due to non-compliances by the successful bidder vis-a-vis instruction of supplier and due to the same BHEL has to procure the additional material then the additional cost with applicable overhead including Taxes & duties shall be recovered from the Successful Bidder.
9.5.	RECONCILIATION OF BHEL ISSUED MATERIALS
9.5.1.	The contractor shall submit a reconciliation statement of cement, steel and Borosilicate materials issued to the contractor with each RA Bill.
9.5.2.	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.
9.5.3.	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.
9.5.4.	The reference drawings for actual material consumption to be used for the purpose of reconciliation shall be drawings prepared by the BHEL and drawings approved by BHEL for fabrication works and such other drawings approved by BHEL. This shall also include the bar bending schedule prepared by the contractor and approved by BHEL.
9.6.	RECOVERY OF MATERIAL

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX: MATERIALS

9.6.1

If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA bill at the penal rate stipulated below.

PENAL RATE OF MATERIALS

Item	Penal rate
Cement (OPC/ PPC/ PSC).	Rs. 6,300 per MT
Reinforcement steel and MS earthing rod/GI flat	Rs. 65,300 per MT
MS Flats, beams, channel, angels etc. (Rolled Sections)	Rs. 65,600 per MT
Chequered Plates and MS plates	Rs. 70,000/- per MT.
Foundation bolts if supplied by BHEL	Rs. 90,000/- per MT

Penal Rate will be 1.05 times the actual cost to BHEL or Rate mentioned in Table 9.6.1 above, whichever is higher, shall be imposed.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-X: BOQ CUM RATE SCHEDULE AND % WEIGHTAGE OF INDIVIDUAL ITEMS

This Chapter consists of Part A & Part B of Volume II “Price bid”:

<u>CONTENTS</u>	
Description	Remarks
PART A:	Instructions to the Bidders
PART B:	PREAMBLE, ‘BOQ CUM RATE SCHEDULE’, %WEIGHTAGE FOR AMOUNT OF INDIVIDUAL ITEMS OF BOQ CUM RATE SCHEDULE (ATTACHED SEPARATELY)
PART C:	Total Price for entire scope of Work (Implanted in the E- Procurement portal entitled as “Vol-II Price Bid”).

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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-XI: ANNEXURES

11.0 Following Technical Specifications shall be integral parts of this tender (attached separately):

- i. FGD Flue Gas Duct Support Foundation Stage-1 :-GA And RC Details Of Foundation From Absorber To Chimney For Unit 1&2
- ii. FGD Chimney- Details of Extra Reinforcement Around Openings Stage-I
- iii. FGD Chimney- Foundation Piling Layout Sh-1 Stage-I
- iv. FGD Chimney- RC Details of Chimney Shell Stage-I
- v. FGD Chimney-Reinforcement Details of Foundation Stage-I
- vi. FGD Chimney- Details of Shell Openings Stage-I
- vii. SECTION – D- GENERAL TECHNICAL REQUIREMENTS (RCC CHIMNEY)
- viii. SECTION-C- SPECIFIC TECHNICAL REQUIREMENTS (RCC CHIMNEY)
- ix. SPECIFIC TECHNICAL REQUIREMENT STACK ELEVATORS
- x. SPECIFIC TECHNICAL REQUIREMENTS FOR ELECTRICAL WORKS

NOTES:

- Contractor has to make him well conversant with the Technical Specifications of Customer (Section-C) and BHEL (Section-D). In case of ambiguity between BHEL's and Customer's specification, Customer's specification shall prevail.
- Above documents have been uploaded Separately.