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

CLAUSE NO	DESCRIPTION
<b>1.0</b>	<b>PROJECT SYNOPSIS AND GENERAL INFORMATION</b>
1.1	<p><b>DETAILS OF PROPOSED STAGE/ UNITS</b></p> <p>Project name: Sagardighi Thermal Power Extension Project, unit # 5, 1x660 MW.  No of unit x capacity: 1 x 660 MW (Super-critical).  Project setting up by: West Bengal Power Development Corporation Limited.  Design ambient dry bulb temp: 50<sup>0</sup> C maximum &amp; 5<sup>0</sup> C minimum  Max relative humidity: 84%.  Average rainfall: 1389 mm.</p>
1.2	<p><b>APPROACH TO SITE</b></p> <p>The site is located at Manigram, about 13 km north of Sagardighi town by the side of the SMGR (Sagardighi-Manigram-Gankar-Raghunathgunj) road at a distance 20 km. from National Highway 34 in Murshidabad district in W.B and around 240 km from Kolkata. Nearest railway station is Manigram adjacent to the site on Bandel-Barhawara branch line and 6.5 km from Sagardighi Railway Station on Sainthia-Azimgunj line of Eastern Railway. Nearest Airport: NSC Bose Air Port, Kolkata. Nearest Seaport: Haldia / Kolkata</p>
<b>2.0</b>	<p><b>SITE VISIT</b></p> <p>The contractor should visit project site and acquire full knowledge and information about conditions prevailing at site and in &amp; around the plant premises, together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid.</p>
<b>3.0</b>	<p><b>NAME OF WORK</b></p> <p>Civil, Structural &amp; Architectural Works for Coal Handling Plant &amp; Ash Handling Plant except leveling &amp; grading, Piling &amp; testing of Piles of 1 X 660 MW Unit-5, Sagardighi TPP Extension</p>
<b>4.0</b>	<b>SCOPE OF WORK</b>
4.1	<p>The scope broadly covers providing labour, supervision, materials (except those which will be supplied by BHEL free of cost), T&amp;Ps, consumables etc as per relevant portion of technical specification and terms &amp; conditions of tender taking into account all clarifications, confirmations and agreements till date for the following jobs:</p> <ol style="list-style-type: none"> <li>1) Wagon Tippler complex including all accessory structures and building as per detailed technical specification.</li> <li>2) MCC Building</li> <li>3) Tunnel</li> <li>4) Crusher House</li> <li>5) Over Ground Transfer Points (TPs)</li> <li>6) Overground Galleries and Trestles</li> <li>7) Area Grading, Roads &amp; Drainage of CHP/AHP areas</li> <li>8) Civil and structural works for Ash handling and disposal system.</li> <li>9) Vacuum pump house cum AHP compressor house</li> <li>10) CHP Utility building.</li> <li>11) Wagon Trippler control building.</li> <li>12) Ash Silo Electrical building.</li> <li>13) Any other structures / buildings as to be envisaged during detailed engineering of the AHP and CHP system.</li> <li>14) Demolition of existing structures / facilities, if any, and site clearance.</li> <li>15) Other Misc. works.</li> </ol>

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4.2	<p>The scope shall include other related works although they may not be specifically mentioned in the subsequent clauses and all such incidental items not mentioned, but are necessary for completion of the work as a whole. The scope also includes supply of all labour, technical personnel, materials, consumables and equipment for execution of work and getting all materials tested at site laboratory or approved laboratory outside, submitting test reports, arranging supervision etc. and execution of the contract with major areas of work mentioned above.</p> <p>Ready mix concrete shall be given by BHEL Free of Cost at Batching Plant inside the plant premises. Bidder has to transport the concrete from batching plant to the location of work. Bidder to submit a receipt of concrete at batching plant based on the print out of batching. Reconciliation of quantity of concrete shall be done based on actual use of concrete at site.</p>
4.3	Any buried pipe/ cable coming in the working fronts are to be removed safely & re-routed by the contractor at no extra cost to BHEL.
4.4	The work to be performed under this specification consists of providing all temporary works, temporary storage sheds for contractors own use, temporary colony for labour and staff, temporary site offices, constructional plant's 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.
4.5	All quality standards, tolerances, welding standards & other technical requirements shall be strictly adhered to. The bidder shall fully apprise himself of the prevailing conditions at the proposed site, climatic conditions including monsoon pattern, soil conditions, local conditions and site specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may not have been specifically brought out in the specifications.
4.6	The scope shall also include setting up by the bidder a testing laboratory (one AC lab size 4.5mtr x 4.5mtr and 1 non AC lab 4.5 mtr x 6mtr) in the field to carry out all relevant tests. Detail of laboratory equipments as per relevant annexure of this tender is to be arranged by the contractor within quoted / accepted rate. For conducting day to day work, one no. chemist / Qualified quality engineer to be deployed as necessary.
4.7	The scope shall also include setting up by the bidder a testing room with compressive test machine for testing of concrete cubes and other site test instruments for conducting day to day testing of concrete cubes, compaction, brick & material testing work. One Qualified quality engineer to be deployed as necessary.
4.8	The successful bidder shall strictly abide by State & Central laws, statutory rules, regulations, Labour law, BOCW etc as indicated in tender. In addition, successful bidder shall comply with PF regulations, etc for all their employees/ workmen as per local authorities/ Governing Body instructions. Compliance with statutory obligations as well as any other requirements/ provisions with respect to successful bidder's manpower, equipment including insurance, medical facilities, minimum wages, safety requirements, accommodations, etc are the responsibility of successful bidder.
5.0	<p><b>DEVIATIONS</b></p> <p>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.</p>
6.0	<p><b>DEWATERING</b></p> <p>Contractor shall ensure at all times that his work area &amp; approach / access roads are free from accumulation of water, so that the materials are safe and the erection</p>

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	/ 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.
<b>7.0</b>	<b>GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)</b>
7.1	Except where otherwise specified, the plant / equipment shall comply with appropriate Indian Standard or an agreed internationally accepted Standard Specification as mentioned elsewhere in tender, each incorporating the latest revisions at the time of tendering. Where no internationally accepted standard is applicable, the bidder shall give all particulars and details as necessary; to enable BHEL to identify all of the plant/ equipment in the same detail as would be possible had there been a standard specification.
7.2	Where the bidder proposes alternative codes or standards he shall include in his tender one copy (in English) of each standard specification to which materials offered shall comply. In such case, the adopted alternative standard shall be equivalent or superior to the standards mentioned in the specification.
7.3	In the event of any conflict between the codes & standards referred above and requirements of this specification, the requirements which are more stringent shall govern.
7.4	Tools used during erection and commissioning shall not be accepted except with the specific approval of the engineer.
7.5	Wherever specified or required the plant / equipment shall conform to various statutory regulations such as Indian Boiler Regulation, Indian Electricity Rules, Indian Explosive Act, Factories Act etc, wherever required, obtaining approval for plant / equipment supplied under the specification from statutory authorities shall be the responsibility of the contractor.
<b>8.0</b>	<b>GENARL SERVICES TO BE RENDERED BY THE BIDDER</b>
8.1	Services for construction, fabrication, erectionetc.under the contract shall include but not be limited to the following.
8.2	Collecting materials from store / open yard from time to time for fabrication / erection as per the construction program and unloading of steel& other material as per flow of consignment. The contractor shall be the custodian of all the materials issued till the plant / equipment is officially taken over by the owner / BHEL after complete erection and commissioning. The contractor shall maintain adequate security personnel and security measures for proper precaution and safety of material.
8.3	Deployment of all skilled and unskilled manpower required for erection supervision, watch & ward, for commissioning and other services to be rendered under this specification.
8.4	Deployment of all erection/construction tools & tackle, construction machinery, transportation vehicles and all other implements in adequate number and size, appropriate for the erection/construction work to be handled under scope of this specification except otherwise specified.
8.5	Supply of all consumables, e.g. welding electrodes, etc as well as materials required for temporary supports, scaffolding etc as necessary for such construction work, unless specified other wise.
8.6	Providing support services for the contractor's erection staff e.g. construction of site offices, temporary stores, residential accommodation and transport to work site for erection personnel, watch and ward for security and safety of the materials under the Contractor's custody etc. as required.
8.7	Maintaining proper documentation of all site activities undertaken by the contractor as per the proforma mutually agreed with BHEL, submitting monthly progress reports as also any such document as and when desired by BHEL/ owner, taking approval of all statutory authorities e.g., Factory Inspector, Provident Fund authority etc. for respective portions of work under the jurisdiction of such statutes of laws.

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8.8	As part of overall project management activity, the contractor shall be responsible for proper co-ordination of erection/construction activities during various phases of execution of the contract. The contractor shall identify a person designated as construction manager, with whom BHEL shall interact on matters related to execution of the contract. The construction manager shall be the single point contact person on behalf of the contractor. BHEL shall interact with the construction manager only on all matters on co-ordination between BHEL and the contractor. For timely completion of work, the contractor may have to work in one or more shifts. He will not be eligible for any extra charge on this account.
8.9	The contractor shall confine all his field operations to those works which can be reformed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms etc and during other unfavourable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in proper and satisfactory manner in the performance of such works and with the concurrence of the engineer. Such unfavourable construction conditions in no way relieve the contractor of his responsibility to perform the works as per the schedule.
8.10	The contractor shall supply all the skilled workmen likewelders, gas cutters, electricians, riggers, sarangs, erectors, carpenters, pipe fitters, masons, ladders, tin-smiths, instrument machanicsetc, in addition to other skilled, semi-skilled and unskilled workmen required for all works of handling and transportation from site store to erection/construction site, construction/erection, testing and commissioning contemplated under this specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserve the right to decide on the suitability of the workers and the other personnel who will be employed by the contractor. BHEL reserves the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.
8.11	The supervisory staff employed by the contractor shall be technically qualified and experienced in the area of work. They shall ensure proper out turn of work and discipline on the part of labour put on the job by the contractor and in general see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL and BHEL's client.
8.12	The contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work. The contractor shall also furnish progress report of work as required by BHEL engineer.
8.13	The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall co-operate with other personnel, and other contractors, co-ordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
8.14	The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerance given in the drawing / instruction given by BHEL Engineer from time to time.
8.15	It is the responsibility of the contractor to engage his workman in shifts or on overtime basis for achieving the target set by BHEL during construction/erection, commissioning and testing period. Contractor's quoted rate shall include all these contingencies.
8.16	Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.
<b>9.0</b>	<b>PROTECTION</b>

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9.1	Equipment having anti-friction or sleeve bearings shall be protected by weather tight enclosures. Coated surfaces shall be protected against impact, abrasion, discoloration and other damages. Surfaces which are damaged shall be repainted.
9.2	Electrical equipments, controls and insulations shall be protected against moisture and water damages. All external gasket surfaces and flange faces, couplings, rotating equipment shafts, bearings and like items shall be thoroughly cleaned and coated with rust preventive compound and protected with suitable wood, metal or other substantial type covering to ensure their full protection. All exposed threaded parts shall be greased and protected with metallic or other substantial type protectors
9.3	All piping, tubing and conduit connections on equipment and equipment openings shall be closed with rough usage covers or plugs. Female threaded openings shall be closed with rough usage covers or plugs or forged steel plugs. The closures shall be taped to seal the interior of the equipment. Open ends of piping, tubing and conduit shall be sealed and taped.
9.4	All other consumables including wire brush, emery papers, painting brush etc to be supplied by the contractor within the quoted rate.
<b>10.0</b>	<b>GENERAL GUIDELINES FOR FIELD ACTIVITIES</b>
10.1	The contractor shall execute the works in a professional manner so as to achieve the target schedule without any sacrifice on safety & quality and maintaining highest standards of safety and cleanliness.
10.2	The contractor shall co-operate with owner/ BHEL and other contractors working in site and arrange to perform his work in a manner so as to minimise interference with other contractor's works. BHEL's engineer shall be notified promptly of any defect in other contractors' works that could affect the contractor's work. If rescheduling of contractor's work is requested by the owner's / BHEL's engineer in the interest of overall site activities, the same shall be complied with by the contractor. In all cases of controversy, the decision of BHEL shall be final and binding on the contractor without any commercial implication.
10.3	The engineer shall hold weekly meeting of all the contractors working at site at a time and a place to be designated by the engineer. The contractor shall attend such meetings and take notes of discussions during the meeting and the decisions of the engineer and shall strictly adhere to those decisions in performing this work. In addition to the above weekly meeting, engineer may call for other meetings either with individual contractors or with selected number of contractors and in such a case the contractor, if called will also attend such meetings.
10.4	Time is the essence of the contract and the contractor shall be responsible for performance of his work in accordance with the specified construction schedule. If at any time the contractor is falling behind the schedule, he shall take necessary action to make good of such delays by increasing his work to comply with the schedule and shall communicate such action in writing to the engineer, satisfying that his action will compensate for the delay. The contractor shall not be allowed any extra compensation for such action.
10.5	The engineer shall however not be responsible for provision of additional labour and or materials or supply of any other services to the contractor except for the co-ordination work between various contractors as set out earlier.
10.6	The works under execution shall be open to inspection & supervision by BHEL's / Owner's engineer at all times. The contractor shall give reasonable notice to BHEL before covering up or otherwise placing beyond the reach of inspection any work, in order that same may be verified, if so desired by owner/ BHEL.
10.7	Every effort shall be made to maintain the highest quality of workmanship by stringent supervision and inspection at every stage of execution. Manufacturer's instruction manual and guidelines on sequence of construction/erection and precautions shall be strictly followed. Should any error or ambiguity be discovered in such documents the same shall be brought to the notice of BHEL's engineer. Manufacturer's interpretation in such cases shall be binding on the contractor.

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10.8	The contractor shall comply with all the rules and regulations of the local authorities, all statutory laws including Minimum Wages, Workmen Compensation etc. All registration and statutory inspection fees, if any, in respect of the work executed by the contractor shall be to his account.
10.9	All the works such as making approaches for movement of manpower & machineries, barricading, scaffolding, cleaning, checking, levelling, blue matching, aligning, assembling, temporary erection for alignment, opening, dismantling of certain structure for checking and cleaning, surface preparation, edge preparation, fabrication of tubes and pipes as per general engineering practice at site, cutting, grinding, straightening, chamfering, filling, chipping, drilling, reaming, scrapping, shaping, fitting-up, bolting/ welding, etc as may be applicable in such construction/erection and necessary to complete the work satisfactorily, are to be treated as incidental and the same shall be carried out by the contractor as part of the work.
10.10	It is the responsibility of the contractor to do the alignment etc if necessary, repeatedly to satisfy engineer, with all the necessary tools & tackles, manpower etc. The alignment will be complete only when jointly certified so, by the contractor's engineer and BHEL. Also the contractor should ensure that the alignment is not disturbed afterwards.
10.11	Equipment and material, in case wrongly installed, shall be removed and reinstalled to comply with the design requirement at the contractor expense, to the satisfaction of BHEL / owner.
10.12	After identification of erection materials by BHEL at BHEL's store/ storage yard, it shall be the responsibility of the contractor to take delivery of materials from BHEL's store/ storage yard by contractor's own manpower and re-stack the leftover materials as per erection sequence at BHEL store at their own cost. The entire activities are to be carried out under supervision of BHEL's engineer.

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<b>11.0</b>	<b>LABOUR AND LABOUR LAWS</b>
11.1	<b>Recruitment of Local Labour:</b> Local labours shall be engaged for unskilled work. Preference may also be given for appointment of local people in semiskilled and skilled categories, if such suitable persons are available.
11.2	<b>Labour Laws and Local Regulations:</b> The Contractor shall abide by the prevailing labour laws and shall have to obtain labour license from the appropriate authority as per the law at his cost and shall indemnify the Purchaser about his financial and other obligations arising out of labours/workers employed by him. On obtaining the labour license, the Contractor at appropriate time shall submit certified photocopy of the same to the Purchaser. The Contractor and its sub contractor (s) shall possess valid PF & ESI Code.
11.3	<b>Wages and Working Hours:</b> The Contractor shall pay rates of Wages and observe hours and conditions of labour not less favourable than those established for the trade or industry in the district where the work is carried out but not less than the applicable minimum wages or by machinery of negotiation or arbitration to which the parties are organizations of employers and trade union's representatives respectively of substantial proportions of the employers and workers engaged in the trade or industry in the district. In the absence of any rates of Wages, hours or conditions of labour so established the Contractor shall pay rates of wages and observe hours and conditions of labour which are not less favourable than the general levels of wages and hours and conditions observed by other contractor whose general circumstances in the trade or industry in which he is engaged are similar.
11.4	<b>Contractor to furnish return of labour employed:</b> The Contractor shall, if required by the Engineer, deliver to the Engineer or to his office a return in such form and at such intervals as the Engineer may prescribe showing in detail category-wise number of classes of labour from time to time employed by the Contractor on the Site and such information respecting construction machinery as the Engineer may require.
11.5	The Contractor shall make his own arrangements for the engagement of all labour and provide on the Site in so far as the Contract otherwise provides, for the transport, housing, feeding and payment thereof.  The Contractor shall, so far as is reasonably practical, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer an adequate supply of drinking and other water for the use of his staff and labour.



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11.6	<p><b>Other Requirements:</b></p> <ul style="list-style-type: none"> <li>a) The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulation or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor, or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his sub-contractor(s), agents of employees.</li> <li>b) The Contractor shall not give, barter or otherwise dispose of to any person or persons any arms or ammunition of any kind or permit the same as aforesaid.</li> <li>c) The Contractor shall in all dealings with labour in his employment have a due regard to all recognised festivals, days of rest and religious or other customs.</li> <li>d) In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local municipal or sanitary authorities for the purpose of dealing with and overcoming the same.</li> <li>e) The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighborhood of the Site against the same.</li> <li>f) The Contractor shall be responsible for observance by his sub-contractor(s) of the foregoing provisions.</li> </ul>
<b>12.0</b>	<b>QUALITY ASSURANCE PROGRAMME</b>
12.1	INSPECTION & FIELD QUALITY ASSURANCE
12.1.1	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.
12.1.2	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.
12.1.3	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.
12.1.4	<p>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.</p> <p>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.</p> <p>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.</p>

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	Record of heat treatments (as applicable under the scope of this contract) performed shall be maintained as prescribed by BHEL.
12.1.5	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. 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.
12.1.6	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 welders shall carry identity cards as per the proforma prescribed by BHEL / Customer / Consultant.
12.1.7	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.
12.1.8	Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next weeks 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.
12.2	REQUIREMENT OF ISO 9001
12.2.1	BHEL: PSER is accredited with ISO 9001 certification and as such this work is subject to various audits to meet ISO 9001 requirements.
12.2.2	<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, &amp; 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>
12.2.3	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.
12.2.4	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.
12.3	MMEs / MMRs
12.3.1	Contractor shall ensure deployment of reliable and calibrated MMEs (Measuring and Monitoring Equipment). The MMEs shall have test / calibration certificates from authorised / Government approved / Accredited agencies traceable to National / International Standards. Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such 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

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	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.
12.3.2	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 else where 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.
12.3.3	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.
12.3.4	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.
12.3.5	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.
12.4	INSPECTION BY TS / FES / QA ENGINEERS OF BHEL UNITS / ENGINEERING CENTRES
12.4.1	Apart from day-to-day inspection by BHEL Engineers stationed at Site and Customer's Engineers, stage inspection of construction/erection activities 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.
12.4.2	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.
12.5	CONFORMANCE TO THE STATUTORY REQUIREMENTS (AS APPLICABLE UNDER THE SCOPE OF THE CONTRACT)
12.5.1	<p>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 with applicable regulations. The work related statutory inspections, though not limited to, are as under:</p> <ol style="list-style-type: none"> <li>1) Inspectorate of Steam Boilers and Smoke Nuisance</li> <li>2) Electrical Inspector</li> <li>3) Factory Inspector, Labour Commissioner, PF Commissioner and other authorities connected to this project work.</li> </ol> <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>

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12.6	STORAGE & PRESERVATION OF WELDING ELECTRODES & OTHER BHEL-ISSUED MATERIAL			
12.6.1	The contractor shall be responsible for storage & preservation of welding electrodes & other BHEL-issued materials as per BHEL Storage & Preservation Guidelines / Instructions.			
12.7	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
<b>GENERAL</b>				
12.7.1	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
12.7.2	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
12.7.3	Not attending quality meeting of BHEL by nominated member of vendor / sub-contractor	Rs. 2,000.00	\$32.00	Per meeting
<b>CALIBRATION</b>				
12.7.4	Use of MMEs without valid calibration certificate	Rs. 1,000.00	\$16.00	Per equipment per instance
12.7.5	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
<b>WELDING &amp; NDT</b>				
12.7.6	Unqualified welders carrying out welding / tack welding	Rs. 1,000.00	\$16.00	Per welder per instance. (Gatepass of the person shall be withheld)
12.7.7	Not using portable oven for welding consumables	Rs. 500.00	\$8.00	Per welder per instance. (The consumables in the oven shall be confiscated)
12.7.8	Not using electrodes pre-baked in baking oven	Rs. 500.00	\$8.00	Per instance. (The subject consumables shall be confiscated)
12.7.9	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)
12.7.10	Non-removal of welding slag and spatters after welding	Rs. 500.00	\$8.00	Per joint

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12.7.11	Not using NDT equipment as prescribed in the manual / FQP / guidelines / Contract	Rs. 1,000.00	\$16.00	Per equipment per instance
12.7.12	Welder doing welding without valid job card	Rs. 500.00	\$8.00	Per instance
12.7.13	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

12.7.14	Non-maintenance of grid pillar marking	Rs. 200.00	\$3.00	Per location week
12.7.15	Mismatch of location of material in store area w.r.t. location mentioned in stock register	Rs. 500.00	\$8.00	Per instance
12.7.16	Non-compliance of Preservation of material as per storage & preservation manuals	Rs. 1,000.00	\$16.00	Per equipment
12.7.17	Not offering received material for verification within stipulated time as per contract	Rs. 500.00	\$8.00	Per instance

#### PAINTING & ALLIED WORKS

12.7.18	Not using primer / paints of approved make and as per Specifications	Rs. 1,000.00	\$16.00	Per instance
12.7.19	Painting without proper surface preparation as per approved schedule / drawing / FQP	Rs. 500.00	\$8.00	Per instance

#### PROTOCOLS & LOG SHEETS

12.7.20	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
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#### INSPECTION OF BOUGHT-OUT ITEMS / CONSUMABLES

12.7.21	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
12.7.22	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 requiring dismantling / rework, attributable to vendor / sub-contractor, shall be penalised at a rate mentioned above or cost to BHEL, which ever is higher.

<b>13.0</b>	<b>HEALTH, SAFETY &amp; ENVIRONMENT</b>
13.1	Refer Document Number: HSEP:14-SGD Rev.: 00, DATE: 25.04.2019 Document Title: Health, Safety and Environment Plan for Site Operation by Subcontractors for Sagardighi.
<b>14.0</b>	<b>DELETED</b>

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<b>15.0</b>	<b>LAND</b>
15.1	Availability of land within plant boundary is very limited and the contractor has to plan and use the existing land considering the use of land by other Civil /mechanical/ electrical contractors and the storage of plant machineries and materials. The existing land shall be shared by all erections agencies. Land will be allocated with certain time frame and to the extent available/ considered necessary, and will be reviewed by BHEL depending upon the area availability.
15.2	Land, as available, may be provided for labour colony by BHEL / WBPDC. The contractor should visit the site to assess the site condition regarding feasibility of use of land for the purpose. The contractor to construct temporary labour colony / hutment as per his requirements after obtaining approval of formalities from statutory body
15.3	The contractor shall provide minimum 1 no overhead water tank with minimum 20 nos. tap in their labour colony for drinking/washing etc purpose. One no cemented area of suitable width, length, with tap (s) for washing purpose etc. also to be provided.
15.4	The contractor shall provide minimum 20 nos of toilet in their labour colony.
15.5	The contractor will be responsible for handing back all lands, as handed over to him by BHEL/ WBPDC.
15.6	Area within plant premises for fabrication, batching plant, office, storage area etc. for construction purpose shall be provided as per availability free of cost.
<b>16.0</b>	<b>WATER</b>
16.1	Construction and drinking water, if available, will be provided to the contractor free of cost at one location within 700 m from the work area. However, additional water source if required may have to be arranged by Bidder as per requirement of work at site with necessary permission from BHEL/WBPDC within the quoted price.
16.2	Further necessary network for construction & drinking water system shall be done by the bidder at his own cost.
16.3	Contractor should arrange on their own, drinking water in their labour colony.
16.4	BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of water supply and the contractor shall claim no compensation for delay in work for such interruption. Contractor may make standby arrangement for water for which no separate payment shall be made by BHEL.
16.5	Contractor will have to arrange for storage of water to meet the day-to-day requirement. Bidder will ensure adequate supply of construction water to meet the requirement of water during major concreting.
16.6	The availability of water (construction as well as drinking) in project site may be limited. Contractor shall ensure that no water is wasted. In this regard the contractor shall take all necessary measure towards preservation of water.
<b>17.0</b>	<b>ELECTRICITY</b>
17.1	CONSTRUCTION POWER & GENERAL ILLUMINATION NETWORK BHEL Shall Provide Construction Power free of charges at 415V level at Two points within 500 M from his work place and bidders has to make his own distribution arrangement to draw electricity.  Provision of suitable temporary lights at different floors/working areas for execution of the work & safety of workmen shall be provided by the vendor, within the quoted rate. The illumination should be such that minimum illumination requirement as specified by Indian standards for general illumination is maintained.
17.2	GENERAL If any other voltage level (other than normally available) is required, the same shall be arranged by the contractor from power supply as above. Contractor will have to provide at his own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized / accredited agency for working out the power consumption. In case of recalibration required for any

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	reason the necessary charges including replacement by calibrated meters is to be borne by the contractor. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules and Regulation as applicable. The contractor shall ensure usage of electricity in an efficient manner and the same may be audited by BHEL time to time. In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.
17.3	The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/ T&Ps are deployed.
17.4	The power supply will be from the available grid. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of power supply/ variation in voltage level and no compensation for delay in work can be claimed by the contractor due to such non-supply on the grounds of idle labour, machinery or any other grounds.
17.5	Bidder will have to arrange sufficient illumination at their own work areas.
17.6	The contractor should ensure that the work in critical areas is not held up in the event of power breakdown and during power break down, vendor will use their own DG set for continuation of job. If the progress of work is hampered owing to interruption in power supply, it will be the responsibility of the contractor to step up the progress of work so that overall progress of work is not affected.
17.7	The contractor shall have to make arrangement at their own cost for illumination that will be required in the working area for execution of the work & safety of workmen.
17.8	Though the construction power is provided free of charge, it is the responsibility of the vendor to ensure efficient utilization of the electricity. Suitable audit shall be carried out jointly by BHEL & vendor on a periodic basis to ensure the same. In case at any point of time it is found that construction power is being used inefficiently or for any other purpose than the intended use, the vendor will be suitably penalized as per the provision of the contract. The maximum penalty that can be imposed on the vendor shall be limited to one month's electricity charges (as will be obtained from the energy meter at drawal point) per incident of inefficient use or misuse.
<b>18.0</b>	<b>PROCUREMENT OF CEMENT &amp; CONSUMABLE</b>
18.1	Although RMC will be provided free of cost by BHEL for execution of PCC & RCC work but for all other works such as brick masonry, plastering etc, Cement required are to be procured by the vendors directly from the manufacturer or their authorized dealers. In case of procurement from dealers, Certificate of dealership to be submitted for approval. Approval of manufacturer to be taken from BHEL / WBPDCCL before placement of order.
18.2	All consumables, like gas, electrodes, chemicals, lubricants etc. required for the scope of work, shall be arranged by the contractor at his cost unless otherwise specifically mentioned in the contract.
18.3	All consumables to be used for the job shall have to be approved by WBPDCCL/ BHEL prior to use.
18.4	In the event of failure of contractor to bring required quantity of cement & necessary consumables, BHEL may arrange for the same at the risk and cost of the contractor. The entire cost towards this along-with overhead shall be paid by the contractor or deducted from the contractor's bills.
<b>19.0</b>	<b>TEST CERTIFICATES</b>
19.1	Necessary test certificates of all materials supplied by contractor are to be produced to BHEL prior to use of those materials.
19.2	Arrangement of testing at Site to be kept for cement (Initial & Final setting Time & compressive strength)
<b>20.0</b>	<b>DELETED</b>
<b>21.0</b>	<b>PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT</b>
	To meet the need of construction management at site, contractor shall provide the following services within quoted / accepted rates.

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21.1	PLANNING & MONITORING
21.1.1	The bidder shall prepare detail construction schedule (L2-/L-3) as per completion dates given in this document. This schedule must include all milestone and key activities for each sub-systems / components in the areas of engineering (wherever applicable), procurement, manufacture (wherever applicable), excavation/ construction/ erection. This network must conform to the overall project schedule. The bidder should also ensure monitoring of these activities at least weekly basis to start with and on daily basis whenever required by BHEL. Successful bidder will submit L-2 Schedule within one week from the date of issue of LOI.
21.1.2	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.
21.1.3	Bidder will have to install 03 (three) no PC (multimedia PC work station having minimum Intel Corei5 processor, 3.6 GHZ or above, 500 GB HDD, 4 GB RAM, 100 MBPS LAN card or above of HP/LENOVO/DELL or equivalent make with Windows 7 or higher O/S with TFT/LCD Monitor of minimum 21" & required software like MS Office 2010 Professional, AutoCAD 2010, PageMaker (7.0 etc), ADOBE PDF CREATOR (version 10.0), DVD Writer with 01 (One) no. laser jet printer compatible for A3 size printing (ink/cartridge for which to be supplied as and when required, for estimation of the bidder, the consumption may be assumed as 1 cartridge per 2 month) & 01 (one) no laser jet printer compatible for A4 size printing (ink/ cartridge for which to be supplied as and when required, for estimation of the bidder, the consumption may be assumed as 1 cartridge per month) with an UPS of APC or Microtech make for power backup at places, as per instruction of BHEL for exclusive use of BHEL. Besides these, 01 (one no. Data Card (Modem) with minimum 3.5 Mbps speed having minimum 10 GB monthly Plan of any reputed Service Provider to be provided by the Vendor per Computer at his cost till work completion for exclusive BHEL use. These PCs/Printers/UPS/Modem shall remain contractor's property and they will be allowed to be taken out after total completion of the site works & placement of Final Bill. The contractor shall provide data/information etc in prescribed formats for periodical updating of the progress reports, material management reports, updating of network pertaining to the contractor's scope of work etc. The contractor shall also provide 03 (Three) nos. computer operator and 05 (Five) nos. support service staff for miscellaneous service for BHEL's use at Site/Kolkata for reconciliation, progress review & day-to-day planning & documentation purposes etc. This facility to be provided as per instruction of BHEL Construction Manager and must be effected within Ten days from the date of written instruction issued by BHEL site Authority and the facilities shall be extended till completion of site works or as decided by BHEL. If contractor fails to provide computer/ printer or 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 pro-rata basis, from contractor's RA bill or any other dues.
21.1.3.1	@ Rs 18,000/- (Eighteen thousand)/ month for each computer operator.
21.1.3.2	@ Rs 8,000/- (Eight thousand)/ month for each computer.
21.1.3.3	@ Rs 4,000/- (Four thousand)/ month for each printer .
21.1.3.4	@ Rs 13,000/- (Thirteen thousand) / month for each Support service staff.
21.1.3.4	In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder. The bidder will be reimbursed at the above mentioned rate or actual +15%, whichever is lower, if the services of operator/ service staff are being used by BHEL.
21.1.4	The contractor's site office must have facilities of communications like E-mail, and telephone with STD facility within a month from LOI.
21.2	PROGRESS REPORTING



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21.2.1	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.	
21.2.2	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.	
21.2.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.	
21.2.4	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.	
21.2.5	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.	
21.2.6	During construction contractor shall take an average forty colour digital photograph / slides (indicating date) each month (not less than five per week) of the works during progress. In case of failure in providing such photograph in each month, an amount of Rs. 20,000/- per month shall be deducted from contractor's RA bill.	
21.2.7	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 CD (as per requirement) and handed over to BHEL as per requirement.	
21.3	SITE ORGANIZATION	
21.3.1	The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all time for smooth execution of the contract headed by a competent construction manager for site operations with sufficient level of authority to take site decisions. The vendor will submit organization chart (showing the name of Site-in-charge) with individual bio-data indicating various levels of experts to be posted for supervision in the fields of supervision and execution, quality, material management, planning, safety, etc. The organization shall be reinforced from time to time, as required to make up slippage (if any) from the schedule without any commercial implication to BHEL. The organization chart is to be submitted within 10 days from the date of LOI.	
21.3.2	Following (minimum) engineering manpower with power plant construction background to be deployed at site by the successful vendor for their day to day supervision etc.	
21.3.2.1	Planning engineer	1 no.
21.3.2.2	Site supervising engineer and supervisors for enabling job viz., leveling grading, Roads & drains job.	One no Enigneer& One no supervisor
21.3.2.3	Qualified safety officers with assistants (exclusive for safety supervision for project jobs).	Officer – 2 nos. Safety Steward - 2 nos.
21.3.2.4	Site supervising engineer and supervisors for supervision of Civil work.	Two Enigneers Six Supervisors
21.3.2.5	Site supervising engineer and supervisors for supervision of Structural work.	Two Enigneers Six Supervisors
21.3.2.6	Engineer & Supervisors for quality inspection.	Two Engineers.

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	Two Supervisors.
21.3.3	Deputation of above man-power shall be jointly decided at site in line with construction schedule.
21.3.4	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.
21.3.5	In the event of non deputation of engineer / supervisor by the bidder as per above agreed schedule, BHEL shall reserve the right to deduct Rs 70,000 per man-month for engineer, Rs 50,000 per man-month for the supervisor/ safety officer and Rs. 35000 per man-month for safety supervisor from RA bills. Further induction of manpower regarding site supervisor & site engineer will be decided at site as per requirement without any financial implication.
21.3.6	BHEL reserves the right to reject or approve the list of personnel proposed by the contractor. The persons whose bio-data have been approved by BHEL will have to be posted at site and deviation in this regard will not be permitted unless specific & reasonable justification is made.
21.3.7	In addition to above, a well experienced qualified engineer to be designated, as 'Project Manager', 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.
21.3.8	The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL.
21.3.9	The contractor should also submit network programs for the construction/erection of various items. These networks shall show the customer / BHEL hold points (CHP), which have to be cleared by customer/ BHEL, or their authorized representatives before further erection can take place. These programs for the construction/erection would clearly identify responsibilities of the contractor and customer/ BHEL. It is the responsibility of the contractor to get the networks approved by BHEL within four weeks of the date of finalization of award of work/ placement of LOI.
21.4	CONSTRUCTION MANAGEMENT
21.4.1	Based on the approved program, the contractor shall submit a program of construction / erection for 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 WBPDCCL / BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets.
21.4.2	The program would be jointly finalized by the site in-charge of the contractor with BHEL / WBPDCCL's project coordinator as well as the site-planning representative. The program will also identify sequential events matching financial turnover.
21.4.3	<p><b>Site Instruction Book:</b></p> <p>The Contractor shall, on receipt of the Engineering-in-charge's order to take up any variation of works, supply at his own cost, Site Instruction Book which shall be kept at site of work under the custody of the Engineering-in-charge or his authorised representative. The Site Instruction Book shall have machine numbered pages in duplicate. Directions or instructions from the Engineering-in-charge to be issued to the Contractor, will be entered (in duplicate) in the Site Instruction Book (except when such directions or instructions are given by separate letter). The Contractor or his authorised representative shall regularly note the entries in the Site Instruction Book and also record thereon the action taken or being taken by him in complying with the said directions or instruction or any relevant point relating to the Work. The Contractor or his authorised</p>

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	<p>representative may take away the duplicate pages of the Site Instruction Book for his own record.</p> <p>Cases of additional work/variation of scope of work shall not be entertained unless supported by entries in the Site Instruction Book or any written order.</p> <p>The first page of Site Instruction Book shall contain the following particulars:</p> <p>i) Name of the work;</p> <p>ii) Reference to Contract No.;</p> <p>iii) Date of opening the Site Instruction Book;</p> <p>iv) Name and address of the Contractor;</p> <p>v) Name and address of the authorised representative (if any) of the Contractor;</p> <p>vi) Signature of the Contractor's representative;</p> <p>vii) Signature of the Engineering-in-charge;</p> <p>viii) Date of recording final inspection;</p> <p>ix) Date of actual completion of Work;</p> <p>Entries vide (viii) and (ix) above shall be filled in on completion of work and before the Site Instruction Book is recorded in the office of the Engineering-in-charge concerned.</p>	
<b>22.0</b>	<b>TOOLS &amp; PLANTS (TO BE PROVIDED BY CONTRACTOR)</b>	
22.1	Tentative list of T&P to be deployed by contractor for successful completion of work is detailed below.	
22.2	It may be noted that the list is not exhaustive and is only for general guidance. The contractor is required to provide all necessary T&P (other than those specified to be provided by BHEL, if any) measuring (calibrated) instruments & handling equipments for timely completion of total work as per contract. In case of project requirement, some activities may have to pre-pone. In such cases the contractor may have to deploy additional T&P. Quoted rate shall be inclusive of such requirements. However, contractor shall submit deployment plan of all T&P along with tender bid.	
22.3	In the event of any failure on the part of the contractor, 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, BHEL will be at liberty to arrange the same at the risk & cost of contractor including transportation cost of same from any of BHEL site/ other agency & charges as applicable shall be deducted from contractor's RA bill. Decision of BHEL in this regard will be final & binding on contractor.	
22.4	Following major T&Ps to be arranged by contractor within the time as indicated against each T&P	
	Major T&P items	Mobilisation time (from the date of written intimation by BHEL to start the work)
	FOR CIVIL WORK	
22.4A.1	3 no Hydraulic Excavator / Poclain.	1st Within 20 days, 2nd within 35 days & 3rd by 45 days
22.4A.2	12 Nos. Tripper / Dumper (10 Cum Capacity)	1st 4 Nos. Within 20 days, Further 4 Nos. within 35 days & balance as per requirement.
22.4A.3	2 nos. JCB.	1st Within 25 days & 2nd as per requirement.
22.4A.4	2 nos Dozer D80	1st Within 25 days & 2nd as per requirement.

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22.4A.5	4 no Self Priming Dewatering Pump 5 HP (diesel / electric).	2 Nos. Within 20 days. Balance within 45 days.
22.4A.6	4 nos 10 HP Submersible Mono-Block Electric Pump (KOS-1040+ of Kirloskar or equivalent).	2 Nos. Within 30 days. Balance within 60 days.
22.4A.7	4 nos Self Priming Dewatering Pump 2/3 HP (diesel/ electric).	Within 30 days.
22.4A.8	One no. 5 HP sludge/sump/slurry electric pump.	Within 30 days.
22.4A.9	3 no Curing Pump – 1.5 / 2 HP	2 nos. within 30 days and balance 1 no. within 60 days.
22.4A.10	1 no. Hydra (12 / 14 T cap) (FX or TRX series of “ESCORT” or equivalent make)	Within 20 days.
22.4A.11	1 no Tractor – 15T.	Within 100 days.
22.4A.12	2 nos. Jack Hammers/ Pavement Breakers.	1st Within 45 days & 2nd as per requirement.
22.4A.13	1 no. Mobile batching plant (5/6 CUM per hr capacity)	On requirement
22.4A.14	6 nos Transit Mixer (5 / 6 cum capacity).	2 nos. within 30 days. Balance 4 nos within 60 days.
22.4A.15	1 no Truck Mounted Concrete Pump with boom placer minimum 40 m Boom.	Within 50 days to facilitate concreting.
22.4A.16	2 nos. concrete pump (20 cum/ hr min capacity & lift 70M)	1st within 30 days & 2nd within 60 days.
22.4A.17	Concrete Vibrator with adequate Needle (2 Nos. diesel driven + 4 Nos. electric driven)	1 no. diesel & 2 nos. electric driven within 30 days & balance within 60 days
22.4A.18	12 mm thick Ply Shuttering Board (9000 sqm).	4500 sqm within 30 days and balance within 100 days
22.4A.19	Ply shuttering of minimum 18 mm thickness(225 sqm)	As per site requirement
22.4A.20	Sheet Pile (Z / U shape) 1000 Sqm	Within 45 days.
22.4A.21	2 nos Reinforcement Bending Machine.	Within 30 days.
22.4A.22	2 nos Reinforcement Cutting Machine.	Within 30 days.
22.4A.23	10,000 RM MS scaffolding pipe / ACROW pipe preferably with cup lock system.	1st 3000 Rm Within 20 days, 2nd 4000 Rm within 60 days & Balance 3000 Rm by 90 days
22.4A.24	4 nos Power Driven Earth Rammer.	2 Nos. Within 90 days balance by 120 days
22.4A.25	1 no Vibromax (earth compacter).	Within 45 days.
22.4A.26	2 no Vibro Compactor – drum width 750mm.	Within 120 days
22.4A.27	1 no Compression Testing Machine (200 T cap).	Within 40 days
22.4A.28	2nos Total Station with adequate arrangement for surveyors..	1st Within 15 days & 2nd Within 45 days.
22.4A.29	2 nos Auto Level & Staff.	Within 15 days.
22.4A.30	48 nos Concrete Cube Moulds.	Within 15 days.
22.4A.31	1 no of Small Trucks 5T for movement within site.	Within 15 days
22.4A.32	One nos Drinking Water Tank – 1000 lit.	Within 30 days.
22.4A.33	1 no Truck Mounted Water Tank (minimum 3000 lit) capacity with sprinkler arrangement.	Within 30 days.

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22.4A.34	1 no 125KVA Electric Generator.	Within 40 days
22.4A.35	Civil Laboratory Equipments as per list attached in per relevant annexure of this TCC	Within 30 days.
22.4A.36	1 no. Concrete cutting power tools (DD2E of HILTI/BOSCH make)	As per site requirement
22.4A.37	1 no. Concrete core Cutting machine for drilling in concrete upto 300 mm dia along with diamond bits	As per site requirement.
22.4A.38	2 nos. electric winch with building hoist	Within 120 days.
22.4A.39	Portable Fire Extinguishers as below for civil & Strl Work Soda Acid – 4 sets. Dry Chemical Powder – 4 sets CO2 – 6 sets. Water & Sand Bucket (2 buckets in one stand) – 4 sets. Fire Hose with Nozzle (50 M length) – 4 sets.	1st set Within 30 days, balance within 90 days
22.4B	FOR STRUCTURAL WORK	
22.4B.1	One no. 150 T Crawler crane for structural erection.	As per site requirement / before start of structural erection
22.4B.2	1 No. 75 T capacity crawler crane	within 60 days
22.4B.3	2 nos. crawler cranes 40/45T capacity crawler / tyre mounted crane	1st within 50 days and 2 <sup>nd</sup> as per site requirement
22.4B.4	6 nos. hydra (12 / 14 T capacity) (FX or TRX series of “ESCORT” or equivalent make)	1st – within 25 days from start of work. Balance progressively as per site requirement
22.4B.5	2 nos. magnetic base drill machine (All Cut)	1 <sup>st</sup> before start of work & 2 <sup>nd</sup> As per site requirement.
22.4B.6	1 nos. submerged arch welding machine	As per site requirement.
22.4B.7	6 nos. MIG machine	3 Nos. Before start of work balancer As per site requirement
22.4B.8	40 nos. welding rectifier	20 Nos. Before start of work balancer As per site requirement.
22.4B.9	2 no. trailor – 15T	1 <sup>st</sup> - Within 100 days. 2 <sup>nd</sup> – As per site requirement.
22.4B.10.1	1 no. 30 T trailer	within 100 days
22.4B.10.2	5 nos. power driven HSFG bolt tightening m/c	3 nos. Within 140 days. Balance as per site requirement
22.4B.11	4 no. torque tightening m/c. (2 no. Capacity up to 30 dia HSFG bolt tightening)	As per site requirement
22.4B.12	Sufficient quantity of steel ladders for approach up to the top of each erected column to be required during erection of columns.	As per site requirement.
22.4B.13	Power winch – 3T - 4 nos for structural erection	Within 150 days
22.4B.14	Power winch – 5T - 2 nos for structural erection	Within 150 days
22.4B.15	1 no ultra-sonography testing machine.	Within 100 days.
22.5	T & P shown in the above mentioned list are minimum requirement. Mobilisation schedule as mutually agreed at site for major T&Ps, have to be adhered to and no change will be permitted. Further requirement will be reviewed time to time at site and contractor will provide additional T&P/ equipments to ensure completion of entire work within schedule/target date of completion without any financial	

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	implication to BHEL. Vendor will give advance intimation & certification regarding capacity etc prior to dispatch of heavy equipments.	
22.6	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.	
22.7	In the event of non mobilisation of any T&P by the successful bidder and as a result progress of work suffered, BHEL reserves the right to deduct suitable amount from the dues of the bidder, with assigning reasons thereof at the following rates	
	Major T&P items	Recovery rates
22.7.1	Hydraulic Excavator / Poclain.	Rs. 25000/- per week or part thereof
22.7.2	Tripper / Dumper (10 Cum Capacity)	Rs. 5000/- per week or part thereof
22.7.3	JCB.	Rs. 15000/- per week or part thereof
22.7.4	Dozer D80.	Rs. 50000/- per week or part thereof
22.7.5	Self Priming Dewatering Pump 5 HP (diesel / electric).	Rs. 5000/- per week or part thereof
22.7.6	10 HP Submersible Mono-Block Electric Pump (KOS-1040+ of Kirloskar or equivalent).	Rs. 10000/- per week or part thereof
22.7.7	Self Priming Dewatering Pump 2/3 HP (diesel/ electric).	Rs. 1000/- per week or part thereof
22.7.8	5 HP Sludge/sump/slurry electric pump	Rs. 5000/- per week or part thereof
22.7.9	Curing Pump – 1.5 / 2 HP	Rs. 500/- per week or part thereof
22.7.10	Hydra (12 / 14 T cap) (FX or TRX series of “ESCORT” or equivalent make)	Rs. 20000/- per week or part thereof
22.7.11	Trailor – 15T.	Rs. 20000/- per week or part thereof
22.7.12	Jack Hammers/ Pavement Breakers.	Rs. 5000/- per week or part thereof
22.7.13	Transit Mixer (5 / 6 cum capacity).	Rs. 25000/- per week or part thereof
22.7.14	Truck Mounted Concrete Pump with boom placer minimum 40 m Boom.	Rs. 50000/- per week or part thereof
22.7.15	Concrete Pump (20 cum / hr min capacity).	Rs. 20000/- per week or part thereof
22.7.16	Concrete Vibrator with adequate Needle	Rs. 2000/- per week or part thereof
22.7.17	12 mm thick Ply Shuttering Board(9000 sqm)	Rs. 1000/- per week or part thereof
22.7.18	Ply shuttering of minimum 18 mm thickness(225 sqm)	Rs. 1500/- per week or part thereof
22.7.19	Sheet Pile (Z / U shape) 1000 sqm	Rs. 40000/- per week or part thereof
22.7.20	Reinforcement Bending Machine.	Rs. 10000/- per week or part thereof
22.7.21	Reinforcement Cutting Machine.	Rs. 5000/- per week or part thereof
22.7.22	Scaffolding pipe / ACROW pipe preferably with cup lock system.	Rs. 10/- per M per week or part thereof
22.7.23	Power Driven Earth Rammer.	Rs. 500/- per week or part thereof
22.7.24	Vibromax (earth compacter).	Rs. 40000/- per week or part thereof

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22.7.25	Vibro Compactor – drum width 750mm.	Rs. 10000/- per week or part thereof
22.7.26	Compression Testing Machine (200 T cap).	Rs. 4000/- per week or part thereof
22.7.27	Total Station with adequate arrangement for surveyors..	Rs. 5000/- per week or part thereof
22.7.28	Auto Level & Staff.	Rs. 5000/- per week or part thereof
22.7.29	48 nos Concrete Cube Moulds.	Rs. 5000/- per week or part thereof
22.7.30	Small Trucks 5T for movement within site.	Rs. 1000/- per week or part thereof
22.7.31	Drinking Water Tank – 1000 lit.	Rs. 5000/- per week or part thereof
22.7.32	Truck Mounted Water Tank (minimum 3000 lit) capacity with sprinkler arrangement.	Rs. 3000/- per week or part thereof
22.7.33	125KVA Electric Generator.	Rs. 15000/- per week or part thereof
22.7.34	Civil Laboratory Equipments as per list attached in per relevant annexure of this TCC	Rs. 5000/- per week or part thereof
22.7.35	Concrete cutting power tools (DD2E of HILTI/BOSCH make)	Rs. 5000/- per week or part thereof
22.7.36	Concrete core Cutting machine for drilling in concrete upto 300 mm dia along with diamond bits	Rs. 5000/- per week or part thereof
22.7.37	Electric winch with building hoist	Rs. 5000/- per week or part thereof
22.7.38	Portable Fire Extinguishers as below Soda Acid. Dry Chemical Powder CO2. Water & Sand Bucket (2 buckets in one stand) Fire Hose with Nozzle (50 M length).	Rs. 1000/- per week or part thereof for any item
22.7.39	150 T Crawler crane for structural erection.	Rs. 50000/- per week or part thereof
22.7.40	75 T capacity crawler crane	Rs. 40000/- per week or part thereof
22.7.41	40/45T capacity crawler / tyre mounted crane	Rs. 25000/- per week or part thereof
22.7.42	Magnetic base drill machine (All Cut)	Rs. 5000/- per week or part thereof
22.7.43	Submerged arch welding machine	Rs. 7500/- per week or part thereof
22.7.44	MIG welding machine	Rs. 5000/- per week or part thereof
22.7.45	Welding rectifier	Rs. 5000/- per week or part thereof
22.7.46	Trailer – 15T	Rs. 20000/- per week or part thereof
22.7.47	Trailer - 30T	Rs. 30000/- per week or part thereof
22.7.48	Power driven HSFG bolt tightening m/c	Rs. 3000/- per week or part thereof
22.7.49	Torque Tightening m/c. (2 no. Capacity up to 30 dia HSFG bolt tightening)	Rs. 2000/- per week or part thereof
22.7.50	Power winch – 3T	Rs. 5000/- per week or part thereof

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22.7.51	Power winch – 5T	Rs. 5000/- per week or part thereof
22.7.52	Ultra-sonography testing machine.	Rs. 3500/- per week or part thereof
<b>23.0</b>	<b>INSURANCE</b>	
23.1	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.	
23.2	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.	
23.3	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.	
23.4	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.	
23.5	Other conditions of Insurance shall be as per relevant clause of GCC/SCC.	
<b>24.0</b>	<b>MATERIAL HANDLING (BHEL ISSUED MATERIAL)</b>	
24.1	Ready Mix Concrete, Reinforcement Steel, earthing Mild Steel rod and Structural Steel, will be issued free of cost by BHEL for use in the work covered in this contract.	
24.2	All other materials required for proper completion of job shall be provided by contractor from approved manufacturers/ suppliers and quoted rates shall be inclusive of this. Consignment of steel will be directly issued to the contractor as received by BHEL, on weightment basis from its supplier, as per delivery challan of supplier.	
24.3	It would be the responsibility of the contractor to keep in constant contact with BHEL / site to find out the delivery status, arrival of the consignments and arrange for escort to accompany the truck / trailer for transportation of above materials by BHEL's supplier, as necessary. The lorry, truck way bill for the consignment as shall be received by BHEL would be handed over to the contractor immediately for unloading of materials including all arrangement for necessary gate passes etc. All arrangement for necessary gate passes etc shall be the responsibility of contractor.	
24.4	Payment of all demurrages that may result due to contractor's fault / delay would be the responsibility of the contractor. If BHEL have to make payment of demurrage together with freight, the amount so paid as demurrages for the reasons stated above, shall be recovered from the bills of the contractor. The decision of BHEL's engineer in this regard will be final and binding on the contractor. However the contractor has to clear all such charges, if any in this regard and complete the job without waiting for BHEL's decision	



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24.5	It would be the responsibility of the contractor to sign on the delivery book acknowledgement slip of supplier / transport authorities etc. & to submit computerized account of all such consignments of materials received by them, daily to BHEL.
24.6	Consignments coming on Sundays and holidays are also required to be handled/unloaded by the contractor. Since the offices and stores will probably remain closed on such days, it will be the responsibility of the contractor to contact BHEL engineers at their residence and obtain instructions.
24.7	Since the consignments are expected to arrive during any time of the day or night, contractor shall have, his workmen round the clock at site as well as other places as required to unload the materials immediately on arrival.
24.8	BHEL reserve the right to recover from the contractor any loss arising out of damage/ theft or any other causes of the materials issued to him at any point.
24.9	Alternately Steel will be issued to the contractor from BHEL / customer's store within the plant premises, on weightment basis. Receipt from BHEL / customer's stores, handling/ transportation to work site, unloading etc will be under the scope of work within his quoted rate.
24.10	Open land (Limited area free from encumbrance), as available, shall be provided by BHEL on free of cost basis. Contractor shall maintain one centralized fenced store cum bar bending yard & fabrication yard (Area approx 10000 Sqm). Hard surfacing of this yard and all round drain shall be carried out by the contractor at his own cost within the quoted rate. Bidder shall make complete arrangement of necessary security personnel, to safeguard all such materials in his custody. Materials issued will be used only for construction of permanent work. The contractor shall take care of material issued by BHEL and shall protect the same from theft, damage and weathering.
24.11	Excessive rusting of steel must be avoided. In case, due to any cause attributable to the contractor, such rusting of steel occur rendering the same unusable, then such quantity of steel shall be recovered from the interim payment at the penal rate specified in the tender.
24.12	The contractor shall construct waterproof cement store (capacity minimum 100 MT) for storing and stacking of cement. CGI / Metal Sheet roofing (slope) with brick masonry wall, PCC flooring. Materials required for the same shall be provided by contractor at his own cost. Cement has to be kept over wooden raised platform. Stacking of cement is to be done as per IS codes with proper illumination and locking arrangements.
24.13	Clodding of cement must be avoided. In case, due to any cause attributable to the contractor, such clodding of cement occur rendering the same unusable, then such quantity of cement shall be disposed immediately from the plant premises by the vendor.
24.14	No material shall be issued to the contractor except as those indicated above i.e Ready Mix Concrete, Reinforcement Steel, earthing Mild Steel rod and Structural Steel. Contractor will have to make his own arrangement at his own cost for procurement of any other material as required for the works and of such quality as acceptable to BHEL.
24.15	The contractor shall maintain proper store account for all the BHEL issued materials and shall give copy once in a month of computerised reconciliation statement along with RA Bill for maintaining account for the BHEL issued material.
24.16	The contractor shall solely be responsible for the safety & quality of material after it is handed over and issued to contractor by BHEL.
24.17	Under any circumstances, BHEL issued materials shall not be taken out of the project site unless otherwise permitted by BHEL.
<b>25.0</b>	<b>ISSUE OF MATERIALS (BHEL ISSUED MATERIAL)</b>
25.1	ISSUE OF STEEL
25.1.1	The steel shall be issued to you free of cost on the following basis.
25.1.1.1	Structural steel (MS plate, ISMB, angle, channel, chequered plate, stainless steel plate) – Weightment basis (unit – MT).

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25.1.1.2	Reinforcement steel (TMT), MS earthing rod – Weighment basis (unit – MT).
25.1.2	<p>All the steel (MS plate, ISMB, angle, channel, chequered plate, stainless steel plate), reinforcement (TMT), MS earthing rod issued by the BHEL shall be properly accounted for. The total quantity of steel required for the work will be calculated from the approved bar bending schedule, fabrication drawings. The measurement for payment as well as for accounting shall be based on the sectional weights as indicated in the following/ applicable latest IS specifications.</p> <p>IS: 808-1964 - Beams, channels and angles. IS:1730-1961 – Plates. Reinforcements Fe-500 confirming to IS:1786 and MS earthing rod Grade-1 of IS:432 (part-I) &amp; IS:1732</p>
25.1.3	In case any such sectional weights are not available in the above documents or can not be derived from above documents, the manufacturer recommendation shall be binding.
25.1.4	The steel issued to you shall be mainly in standard length and sections as received from the supplier. However, you shall be bound to accept the steel in length as available in the project no claims for extra payment because of issue of non-standard length will be entertained.
25.1.5	You shall satisfy yourself of the quality and quantity of the materials at the time of taking delivery from BHEL/ owner. No claims whatsoever will be entertained by BHEL because of quality or quantity after the materials are taken by you from BHEL/ owner stores.
25.2	You have to ensure that no lamination materials are taken over from BHEL. Fabrication wastage, if any due to above, shall not be compensated by BHEL.
25.3	The contractor shall submit to the engineer, a statement indicating estimated quantity of steel required at least two months in advance. In addition, the contractor shall also furnish the estimated requirement of steel during a month by the third week of the previous month. Failing which BHEL will not responsible to ensure supply of steel. Delay in completion if any for the same shall be in bidders account.
25.4	You have to note that all fasteners like MS/ HT/ HSFG bolts/nuts, lock nuts, washers etc shall be supplied by you as per applicable item of price schedule.
25.5	You have to note that cement/concrete and steel required for your enabling job like store/ site office etc shall be arranged at your own cost.
25.6	ISSUE OF READY MIX CONCRETE
25.6.1	Bidder has to give a receipt of quantity of Ready Mix Concrete at the time of taking of concrete at batching plant. For ensuring quantity, bidder may check the print out of concrete from batching plant.
25.6.2	The contractor shall submit to the engineer, a statement indicating estimated quantity of Ready Mix Concrete required at least two months in advance. In addition, the contractor shall also furnish the estimated requirement of Ready Mix Concrete during a month by the third week of the previous month. Failing which BHEL will not responsible to ensure supply of Ready Mix Concrete. Delay in completion if any for the same shall be in bidders account.
<b>26.0</b>	<b>RETURN OF MATERIALS</b>
26.1	RETURN OF STEEL INCLUDING SCRAP
26.1.1	All surplus steel and all wastage materials will be taken back on weighment basis.
26.1.2	Surplus, unused and un-tampered steel shall be sorted section-wise and returned separately at a place as directed by BHEL/ engineer within the project area; Return of such materials will not be entitled to any handling and incidental charges.
26.1.3	All wastage/ scrap (including wastage, unusable scrap) shall be returned to the stores on weighment basis and a receipt be obtained for material accounting purposes. Return of such material will not entitled the contractor to any additional cost due to handling, transportation and incidental charge.
26.1.4	Scrap for reinforcement steel and structural steel shall be returned separately.
26.2	RETURN OF READY MIX CONCRETE

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26.2.1	Under any circumstances Ready Mix Concrete will not be taken back. Bidder to plan accordingly for proper use of Ready Mix Concrete.		
<b>27.0</b>	<b>CEMENT &amp; STEEL CONSUMPTION AND WASTAGE</b>		
27.1	<b>REINFORCEMENT STEEL &amp; MS ROUND CONSUMPTION</b>		
27.1.1	The theoretical consumption of various diameter of reinforcement and 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.		
27.1.2	Actual consumption = Issue – Surplus.		
27.1.3	Surplus = Un-tampered and unused quantity of steel returned by the contractor to BHEL store along-with relevant documents.		
27.1.4	Wastage = Actual consumption – Theoretical consumption.		
27.2	<b>REINFORCEMENT STEEL &amp; MS ROUND WASTAGE</b>		
27.2.1	Allowable wastage: (+3%) of the theoretical consumption shall be considered as allowable wastage.		
27.2.2	Wastage and scrap shall be as per actual weighment basis.		
27.2.3	SI no	Reinforcement steel , 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
27.3	<b>STRUCTURAL STEEL CONSUMPTION</b>		
27.3.1	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 you for any deviation in weights for the two different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances.		
27.3.2	Actual consumption = Issue – Surplus.		
27.3.3	Surplus = Untempered, unused, uncut quantity of steel returned by you to BHEL store.		
27.3.4	Wastage = Actual consumption – Theoretical consumption.		
27.4	<b>STRUCTURAL STEEL WASTAGE</b>		
27.4.1	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 weightment 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 (i.e. four percent).		
27.4.2	Structural steel including SS plate		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 four percent (+4%) of aforesaid theoretical consumption (S-1) towards allowable	Free

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		wastage(including invisible wastage limited to 0.5%) and return to BHEL Store.	
	S-2b	Wastage limited to plus four percent (+4%) of aforesaid theoretical consumption (S-1) towards allowable wastage(including invisible wastage limited to 0.5%) but not returned to BHEL Store.	Penal rate
	S-3	Wastage beyond plus four percent (+4%) of the aforesaid theoretical consumption (S-1).	Penal rate
27.5	All wastage reinforcement, MS round and structural steel shall be returned to BHEL.		
27.6	READY MIX CONCRETECONSUMPTION		
27.6.1	The theoretical consumption of various grade shall be based on approved construction drawing. Quantity shall be calculated considering the volume of concrete as per approved drawing. No extra cost shall be payable to the contractor for any deviation in quantity of Ready Mix Concrete received from the Batching Plant and actual use at site.		
27.7	READY MIX CONCRETE WASTAGE		
27.7.1	Allowable wastage: +1.5% of the theoretical consumption shall be considered as allowable wastage.		
28.0	RECONCILIATION OF BHEL ISSUED MATERIALS		
28.1	You shall submit a reconciliation statement of cement and steel issued to you, once in a month. The same may be submitted alongwith RA bill.		
28.2	You shall properly account for the material issued to you as specified herein to the satisfaction of BHEL certifying that the balance material are available in your custody at site.		
28.3	If it is noticed by BHEL that the wastage is high and calls recovery at the penal rate, then BHEL will proceed for recovery for the excess wastage as per penal recovery rates as specified from RA bill.		
28.4	The approved drawings/ bar bending schedules are to be considered for the purpose of reconciliation of materials.		
28.5	Reconciliation of steel shall be done on total issue & consumption basis.		
29.0	RECOVERY OF MATERIAL		
29.1	If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA bill at the penal rate stipulated below.		
29.2	PENAL RATE OF MATERIALS		
	Item	Penal rate (Rs)	
29.2.1	Reinforcement steel and MS round etc.	75,000 per MT.	
29.2.2	Stainless steel plate.	6,00,000 per MT	
29.2.3	Structural steel materials.	90,000 per MT	
29.2.4	Ready Mix Concrete		
	M - 7.5	6,500 per Cum	
	M - 10	7,000 per Cum	
	M - 15	7,850 per Cum	
	M - 20	8,600 per Cum	
	M - 25	8,700 per Cum	
	M – 30	8,900 per Cum	
	M - 35	12,300 per Cum	
	M - 40	12,600 per Cum	
30.0	CONSTRUCTION OF TEMPORARY OFFICE, STORES ETC		
	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.		
31.0	CIVIL LABORATORY AT SITE		
	Contractor shall establish and maintain civil laboratory with necessary equipment (as per Annexure-A) for conducting relevant site tests, as required.		
32.0	CONSTRUCTION SCHEDULE		

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32.1	Entire work shall be carried out in accordance with the construction schedule given below, within the stipulated completion period. Within 30 days of LOI, the contractor shall discuss with BHEL site engineer & furnish the (L-3) construction schedule indicating all milestones on the basis of major activities and get it approved from BHEL Engineer.	
32.2	Schedule for major construction activities covered under the scope of work is as below.	
	Major activity description	Completion schedule from the date of start of work as certified by BHEL engineer at site.
32.2.1	Wagon Tippler Complex up to GL	Within 16 Months
32.2.2	MCC Building Readiness	Within 18 months
32.2.3	Tunnel	Within 20 Months
32.2.4	Crusher House Civil & Structural Work	Within 22 Months
32.2.5	Civil and Structural Work for conveyor system	Progressively within 23 Months
32.2.6	Civil & structural work of Ash handling and disposal system	Within 32 Months
32.2.7	All Other works.	Within 36 Months
32.3	The contractor shall plan his work in such a manner so as to meet the overall project schedule, in consultation with BHEL/ customer engineer.	
32.4	Contractor shall submit daily work program based on above construction schedule.	
<b>33.0</b>	<b>COMPLETION PERIOD</b>	
33.1	The entire work under this scope shall be successfully completed in all respect within 36 (thirty six months) from the date of start of work as certified by Construction Manager, BHEL.	
33.2	Contractor shall mobilise resources to start the work within 15 days from date of intimation to BHEL.	
33.3	However, actual date of start of work shall be reckoned based on certification of Construction manager,	
<b>34.0</b>	<b>LIQUIDATED DAMAGE/ PENALTY</b>	
34.1	Intermediate Milestones	
34.1.1	Liquidated damage shall be imposed for non achievement of Milestones as mentioned in Clause 32.2.1, 32.2.2 & 32.2.3 above. Applicable rate for LD deduction will be 0.10% per week of Contract Value, limited to maximum 2% of executable contract value plus applicable GST which will be withheld till completion of job and decision of deductible LD amount.	
34.1.2	Also for non achievement of further Milestones as mentioned in Clause 32.2.4, 32.2.5 & 32.2.6 above similar intermediate Milestone LD will be imposed at the rate of 0.10% per week of Contract Value, limited to maximum 3% of executable contract value plus applicable GST. This amount shall also be withheld till completion of job and decision of deductible LD amount.	
34.1.3	Amount already withheld, if any against slippage of milestones as per clause 32.2.1, 32.2.2, 32.2.3, 32.2.4, 32.2.5, 32.2.5 & 32.2.6 above, shall be released only if there is no delay attributable to contractor in achievement of Milestone as mentioned in clause 32.2.7.	
34.1.4	Amount to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld from the immediate next RA bills of scheduled milestone dates, in case milestone dates could not be achieved by the agency, and it is to be withheld @10% of RA Bill amount until the specified limit of LD amount is reached.	
34.1.5	In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.	
34.2	Overall Completion	

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34.2.1	<p>In the event of any delay attributable to the contractor towards completion of job as per contract and handing over of facilities with acceptable standards/quality within the period as stipulated in the contract or any extension thereof, the contractor shall be liable to pay Liquidated damage (LD) to BHEL for the delay at the rate of 0.25% of the contract price per week plus applicable GST.</p> <p>This Liquidity Damage (LD) on account of delay in the completion schedule (36 months) and short fall of performance shall be limited to cumulative capping of 10% of contract price plus applicable GST.</p>
34.3	In all bidder's liabilities on account of LD (for non completion of overall scope of works and non achievement of intermediate milestones) shall be restricted to 15% of executable contract price plus applicable GST.
34.4	LD withheld amount shall be paid to the contractor if the overall completion schedule is achieved as per the contractual time period.
34.5	All other terms shall be as per the provision of GCC.
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 the Milestone.
<b>35.0</b>	<p><b>CERTIFICATE TOWARDS COMPLETION</b></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 BHEL/ customer. Decision of BHEL in this regard shall be final and binding on the contractor.</p>
<b>36.0</b>	<b>GUARANTEE</b>
36.1	Even though the work will be carried out under supervision of BHEL, the contractor will be responsible for the quality of workmanship, quality of materials/ items and design for which the contractor is responsible.
36.2	<p>The contractor shall guarantee the work executed under the scope of the contract for a period of:</p> <p>18 (Eighteen) months from the date of completion of contract scope of work and handing over to BHEL/WBPDCL</p> <p style="text-align: center;"><b>OR</b></p> <p>12 (Twelve) months from date of operation acceptance of CHP &amp; AHP system whichever is earlier.</p> <p>Contractor shall rectify free of cost all defects due to faulty supply or work done. In case the contractor fails to repair/ replace the defective works within the time specified by the engineer, BHEL may proceed to undertake the repairs/ replace such defective works at contractor's risk and cost without prejudice to any other rights and recover the same from security deposit/ other dues.</p>
<b>37.0</b>	<p><b>INTEREST BEARING RECOVERABLE ADVANCE/ MOBILISATION ADVANCE</b></p> <p>Not applicable for this tender.</p>
<b>38.0</b>	<p><b>OVER RUN CHARGES</b></p> <p>Not applicable for this tender.</p>
<b>39.0</b>	<p><b>REVISION ON ACCEPTED CONTRACT RATE</b></p> <p>Not applicable in this tender.</p>
<b>40.0</b>	<p><b>PRICE VARIATION CLAUSE</b></p> <p>Applicable as per the relevant clause of GCC.</p>
<b>41.0</b>	<p><b>EXTRA/ ADDITIONAL ITEMS OF WORK</b></p> <p>It shall be as per GCC.</p>
<b>42.0</b>	<b>SECURITY DEPOSIT, PERFORMANCE BOND &amp; FINAL BILL</b>
42.1	Security deposit shall be applicable as per relevant clause of GCC (Volume-IB).
42.2	Performance bond is not applicable for the tender.
42.3	<p><b>RELEASE OF SD BG AND FINAL BILL</b></p> <p>In addition to other provisions of tender regarding release of SD and final bill, following provisions shall also be governing to this tender.</p>

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42.3.1	For SD BG- further extension beyond date of acceptance of final bill will not be enforced if the following is fulfilled.
42.3.1.1	Contractor discharges their responsibility in r/o of submission of final bill alongwith absolute 'No Demand Certificate' and other documents as detailed below to the satisfaction of BHEL
42.3.1.2	Joint protocol of set of documents as submitted as detailed in below is certified by site & contractor's representative.
42.3.1.3	There is no negative value of the final bill (after release of SD BG) - site to certify the same before release of SD BG.
42.3.1.4	Contractor has returned the property belonging to BHEL- site to certify the same before release of SD BG.
42.3.1.5	Contractor has submitted joint protocol against 'Delay analysis', if applicable for delayed execution of job.
42.3.2	List of documents to be submitted & jointly protooled indicating acceptance of final bill by BHEL.
42.3.2.1	Final bill.
42.3.2.2	Measurement for final bill signed, jointly signed by BHEL & contractor's representative.
42.3.2.3	Statement having cumulative joint measurement for the contract, jointly signed by BHEL & contractor's representative.
42.3.2.4	Claim by contractor for refund of security deposit.
42.3.2.5	Jointly signed material reconciliation statement.
42.3.2.6	Statement of payment received from BHEL – Bill wise (Including RA/ PVC/ ORC/ rate revision/ extra work).
42.3.2.7	No claim certificate by contractor.
42.3.2.8	Clearance certificates wherever applicable, viz clearance certificates from customer, various statutory authorities, like Labour Department, PF Authorities, Commercial Department, etc.
42.3.2.9	Notarized Indemnity Bond as per prescribed format.
<b>43.0</b>	<b>TAXES, DUTIES ETC</b>
43.1	<p>All taxes excluding GST but including BOCW and other statutory Charges, Royalties, any State or Central Levy and other taxes for materials if any obtained for the work and for execution of the contract shall be borne by successful bidder and shall not be payable extra by BHEL.</p> <p>Any increase of above at any stage during execution of contract, including extension of the contract, shall have to be borne by successful bidder contractor. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.</p>
43.2	GST (as applicable) legally leviable& payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST (as applicable) in their quoted rates/ price.
43.3	Successful bidder shall furnish proof of GST registration with GSTN Portal covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by successful bidder on BHEL for this project / work.
43.4	Since GST on output will be paid by BHEL separately as enumerated above, bidder's quoted rates / price should be after considering the Input Credit under GST law at bidder's end.
43.5	TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills (RA bills) unless exemption certificate from the appropriate authority / authorities is furnished.
43.6	TDS under GST (if / as & when applicable later) shall be deducted at applicable rates on gross invoice value from the running bills (RA bills). However, as on date no TDS under GST is applicable.

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43.7	Bidder shall note that GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred thereunder) wherein the 'Bill To' details shall encompass following. BHEL GSTN – Refer attached GSTN code table of BHEL. Name - BHARAT HEAVY ELECTRICALS LIMITED Address - Shall be intimated later. Specific details of BHEL GSTN, Name and Address as stated above, have been specified elsewhere in the tender.
43.8	Successful bidder to intimate immediately on the day of removal of goods (in case of any supply of goods) to BHEL along with all relevant details and send a scanned copy of Tax Invoice to BHEL through following communication mode for enabling BHEL to meet its GST related compliances. Portal address and Email address – Shall be intimated later. Specific details of above shall be intimated to successful bidder by BHEL at appropriate juncture.
43.9	In case of delay in submission of above mentioned documents on the date of despatch, BHEL may incur penalty / interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from successful bidder, in case such delay is not attributable to BHEL.
43.10	In case of raising any Supplementary Tax Invoice (Debit / Credit Note), successful bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
43.11	Successful bidder shall comply with the Time Limit prescribed under the GST Law and rules thereof for raising of the Tax Invoice. If any supply of goods is applicable, successful bidder shall also ensure prompt delivery of goods after despatch.
43.12	Bidder shall note that in case GST credit is delayed / denied to BHEL due to delayed / non receipt of goods and / or Tax Invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons, not attributable to BHEL, GST amount shall be recoverable from successful bidder along with interest levied/ leviable on BHEL, as the case may be.
43.13	Successful bidder shall upload the invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the successful bidder along with interest levied / leviable on BHEL.
43.14	Way Bill: Successful bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract. Successful bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit / Way Bill, if required, shall be arranged by successful bidder and BHEL will not supply any Road Permit/ Way Bill for this purpose.
43.15	Any new taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extension, if the same is not attributable to you), shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
43.16	Benefits and / or abolition of existing taxes must be passed on to BHEL against new taxes, if any, proposed to be introduced at a later date.
<b>44 .0</b>	<b>INTERIM PAYMENTS</b>



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44.1	For all items of work as per Volume-III, Price Schedule, interim payment shall be limited to 95 % of the gross value of interim bill on item rate basis. The balance 5 % shall be payable on completion of guarantee period. However, this 5 %, retained from each RA bill, may be released against submission of a separate bank guarantee as per Performance Bank Guarantee format, to be kept valid till final bill & guarantee period, subject to (i) Receipt of certificate that all works are completed in all respects; (ii) Reconciliation of materials / T&P / IMTE; (iii) Completion of final bill formalities and (iv) handing over to BHEL / customer.
44.2	All admissible recovery / adjustments etc. shall be made from the interim payable amount.
44.3	Out of this 95 %, 1.5 % of gross bill amount shall be paid in the following manner on certification by BHEL engineer after compliance of each of following activity in each month. In case of non-fulfilment of respective activity by vendor in each month, no payment shall be made by BHEL against corresponding activity and no claim of bidder at a later date, whatsoever, in this regard shall be entertained by BHEL.
44.3.1	0.7 % shall be paid on compliance of house keeping of vendor's working area and store/ office areas.
44.3.2	0.3 % shall be paid on compliance of general illumination of vendor's working area and stores, office area.
44.3.3	0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.
44.3.4	0.3 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.
44.4	BHEL site at its discretion may further split up the above percentages of break up or item rates of price schedules (vol-III, schedule 3 & 4) and effect payment to suit the site condition, cash flow requirement, according to the progress of work.
44.5	The contractor shall submit his running bill, once in a month at the end of each month. The RA bill complete in all respect, accompanied by BHEL engineers certified measurement sheets, jointly signed, will be paid after 45 days of submission of bill, subject to completeness and correctness. Income Tax at the prevailing rates on gross value of work done & applicable surcharge shall be deducted from contractor's bill, unless exempted by Income Tax Authority.
44.6	Applicable GST, which can be claimed at any point, shall be released to you upon compliance of following:
44.7	You declaring such Invoice in your GSTR-1
44.8	Receipt of Goods / services and Tax Invoice by BHEL
44.9	Confirmation of payment of GST thereon by you on GSTN Portal
44.10	Above is subject to receipt of goods / service and tax invoice thereof along with you declaring invoice in your return and paying GST within timeline prescribed for availing ITC by BHEL.
<b>45.0</b>	<b>CONTRACT PRICE</b>
45.1	The bidder shall quote their rates strictly in accordance with prescribed rate schedule of Volume-III (SCH-3&4)
45.2	The quantities of the various items mentioned in the BOQ cum price schedule (Volume-III) are approximate, based on very preliminary information and may vary to any extent or be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of the work executed under any part of the this contract including extra items, if any, but excluding any price variation, remains within +/- 15 % (fifteen percent) of the awarded price as per LOI / WO.
<b>45.3</b>	Bidders may note that total quantity payable against items of SCH-4 of Vol-III (required for execution at site of items of SCH-3 of Vol-III) will be restricted to final executed quantity of corresponding items of SCH-3 of Vol-III on completion of contract scope of work and at the time of final measurement.

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<b>46.0</b>	<b>DESIGN OFFICE, FABRICATION DRAWING FOR STRUCTURAL STEEL WORKS</b>
46.1	Design/engineering drawings of steel structures shall be issued to the contractor time to time by BHEL, contractor will prepare & submit 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 or BHEL / ISG Bangalore within 15 days of receipt. BHEL reserves the right to assess the capability of the agency to be deployed by contractor for preparation of such fabrication drawing, and prior approval from BHEL Engineering office at Noida, is required for appointment of such agency.
46.2	Contractor shall also appoint a separate agency, approved by BHEL, for review and approval of fabrication drgs, in consultation with BHEL
46.3	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.
46.4	Contractor shall submit progress report pertaining to fabrication drawing, by 7th of each month, section-wise cumulative bill of materials for which engineering drawing has been issued to them and status of fabrication drawing.
46.5	Contractor shall also submit progress report pertaining to review and approval of fabrication drawing, by 7th of each month.
46.6	It may be noted by the bidder that quality plan for erection of bolted structures will be highly stringent. Quality plan for structural works will be issued during execution stage upon approval of customer (WBPDCCL).
46.7	Bidder, at his own cost, shall supply electrodes required for fabrication, erection of structural steel as per specification and approval of BHEL.
46.8	Above mentioned clauses pertaining to consumption and wastage of structural steel applies to those materials issued by BHEL for site fabrication.
<b>47.0</b>	<b>METHOD OF MEASUREMENT</b>
47.1	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.
<b>47.2</b>	Method of measurement for earth work shall be as per following:
<b>47.3</b>	Earthwork in excavation - Measurement shall be as per actual excavated quantity at site and as per clause 5.2.0 of Technical Specification, Section D, Sub-Section D1 of VOL-II B (Standard Technical Specification).
<b>47.4</b>	Earthwork in backfilling – Measurement shall be as per excavation quantity after deduction for concrete etc. Difference in final backfilled level with respect to initial ground level shall also be taken into account for deduction, if any, from excavation quantity.
<b>48.0</b>	<b>OTHER TERMS</b>
48.1	While bidder's scope includes 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.
48.2	All other term & conditions of this specification, not mentioned above shall be governed by the pertinent provisions of GCC, Volume-IB.

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**ANNEXURE - A**  
**LIST OF EQUIPMENTS FOR CIVIL SITE LABORATORY**

SL NO	NAME OF TEST	NAME OF EQUIPMENT	SIZE OF EQUIPMENT	REF
<b>CONCRETE TESTING EQUIPMENT</b>				
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 48 Nos.	IS 10086
3	Workability of concrete	Slump cone	Standard, atleast 04 nos	IS 456
4	Initial & final setting time, Consistency of cement	Vicat Apparatus with desk pot	Standard	IS 5513
5	Cement mortar cube casting	Mortar Cube mould	70.6 x 70.6 x 70.6 mm, minimum 09 sets desired.	IS 10086
6	Cement mortar cube vibrating machine	Motorised vibration machine for cement testing	Standard	IS 4031
<b>SOIL TESTING EQUIPMENT (LEVELLING &amp; GRADING)</b>				
1	Core Cutter test	core cutter apparatus	Rammer, 6 nos of std core cutter mould, dolly	IS 2720
2	Proctor density test	Std proctor Compaction apparatus	Standard	IS 2720
3	Moisture Content	Rapid moisture meter	Standard, atleast 04 nos	IS 2720
<b>PROCESS CONTROL ACCESSORIES</b>				
1	Hot air oven	Temperature range 50° C to 300° C	600x600x600mm (min.size)	
2	Electronic balance	2 nos	600g x 0.01g, 5g	
3	Physical balance	10 kg capacity	Weights upto 10 kg	
4	Thermometer	Temperature range 0° C to 150° C	Digital	
5	Measuring jars	2 nos set of each size	100ml, 200ml, 500ml & 1000 ml	
6	Gauging trowlers	2 nos	100mm & 200 mm with wooden handle	
7	Spatula	2 nos	100mm & 200 mm with long blade wooden handle	
8	Stainless steel scoop	2 nos	2 kg and 5 kg	
10	Digital pH meter	02 nos	0.01 mm least count,	
11	GI tray	02 nos	600x450x50mm, 450x300x40mm,	
12	Digital Vernier Caliper	01 nos	Least count 0.01	
13	Screw Gauge	01 nos	0.1 mm-10mm, Least count 0.05	
14	Digital paint thickness meter for masanory / concrete painting measurement	02 nos	150 micron range	
15	Standard Sand for Cement Test	3 type of sand	50 Kg each.	

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**NOTE :**

TENTATIVELY LIST OF SUPPLIERS / DESIGNERS IS PROVIDED HEREUNDER. HOWEVER, IN CASE THE BIDDER PROPOSES TO PROCURE ITEMS FROM OTHER SUPPLIERS, SPECIFIC APPROVAL SHALL BE REQUIRED TO BE TAKEN FROM BHEL / WBPDCCL AS PER APPROVED QP. FURTHER BIDDER MAY NOTE THAT LIST CONSISTS OF ONLY TENTATIVE VENDORS. SPECIFIC APPROVAL MUST BE TAKEN FROM BHEL / WBPDCCL PRIOR TO EXECUTION AT SITE.

SL. NO.	ITEM	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING	REMARKS
1	CONSTRUCTION CHEMICALS - ADMIXTURES, PLASTISIZERS, RETARDERS WATER PROOFING COMPOUNDS GROUTS	SIKA INDIA LTO	-	
		CICO TECHONOLOGIES LTD	-	
		FOSROC CHEMICALS (I) PVT LTD	-	
		BASF	-	
2.	FALSE CEILING- GLASS REINFORCED GYPSUM SYSTEM, MINERAL FIBRE BOARD SYSTEM,PREPAINTED COIL COATED STEEL SYSTEM	SAINT GOBAIN	NEW DELHI	
		HUNTER DOUGLOUS	MUMBAI	
		TIGER STEEL	PUNE/MUMBAI	
		INTERARCH	NOIDA	
		LLOYD INSULATION	-	
		MG INDUSTRIES	FARIDABAD	
3	PAINT AND PAINTING SYSTEM	ARM STRONG	NEW DELHI	
		BERGER	-	
		SHALIMAR PAINTS	-	
		JENSON AND NICHOLSON	-	
		KANSAI NEROLAC	-	
		AKZO NOBEL	-	
4	COLOUR COATED SHEET (FOR COIL)	ASIAN PAINTS	-	
		UNION STEEL	KOREA	
		DONGBU STEEL	KOREA	
		BHUSHAN STEEL AND STRIPS LTD.	RAIGAD	
		ESSAR STEEL LTD	PUNE	
		NATIONAL STEEL AND AGRO	DHAR	
		JSW STEEL COATED PRODUCTS LTD	KAMLESHWAR	Formerly JSW ISPAT Steel Ltd
		BHUSHAN STEEL LTD.	SAHIBABAD	
		JSW LTD	THANE	
		TATA BLUESCOPE STEEL LTD	JAMSHEDPUR	*AL-ZN COIL FOR CLADDING

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5	PROFILERS FOR DECKING SHEETS	UNIMET PROFILES LIMITED	DHARUHERA	
		MULTICOLOUR STEEL INDIA LIMITED	GURGAON	
		ISOLLOYD	SOLAN	
		NATIONAL STEEL AND AGRO	DHAR	
		ERA BUILD SYS	RUDRAPUR	
		TATA BLUE SCOPE	PUNE	HINJEWARI WORKS
		TATA BLUE SCOPE	BHIWADI	
		PENNNAR INDUSTRIES	HYDERABAD	
		ALFA STEEL BUILDING SOLUTIONS	HOSUR	
6	PROFILERS FOR CLADDING SHEETS	MULTICOLOUR STEEL INDIA LIMITED	GURGAON	
		UNIMET PROFILES LIMITED	DHARUHERA-HARYANA	
		ERA BUILD SYS	RUDRAPUR	
		TATA BLUE SCOPE	PUNE	HINJEWARI WORKS
		TATA BLUE SCOPE	BHIWADI	
		PENNNAR INDUSTRIES	HYDERABAD	
		ALFA STEEL BUILDING SOLUTIONS	HOSUR	
		ISOLLOYD	SOLAN	
		NATIONAL STEEL AND AGRO	DHAR	
7	ELECTROFORGED GRATING	INDIANA GRATING	PUNE	
		PREMIER POWER PRODUCTS (CALCUTTA) PVT LTD	HOWRAH	
		GREATWELD	PUNE	
		BHOLA RAM STEELS	PATNA	
		KANADE ANAND UDYOG	THANE	
		PINAX STEEL INDUSTRIES	PATNA	
8	GI PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	

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9	PVC WATER STOP	DURON POLYVINYLS PVT. LTD	GURGAON	
		KANTA RUBBER	HYDERABAD	
		MARUTI RUBBER	NOIDA	
		JYOTI POLYVINYL	VADODARA	
		DEEP-JYOTI RUBBER PVT LTD	NOIDA	
10	BITUMEN ASPHALT	ALL GOVERNMENT REFINARIES	–	
11	PLASTIC, PVC PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
12	BITUMEN IMPREGNATED FIBER BOARD JOINT FILLER, BITUMEN SEALING COMPOUND	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
13	ALUMINUM COMPOSITE CLADDING	INDOMAX	ROORKEE	
		ALSTONE	DEHRADUN	
14	CERAMIC / VITRIFIED TILES	KAJARIA	-	
		SOMANY		
		SPARTEK INDIA	-	
		NITCO	-	
		ORIENT BELL	-	
		MARBITO		
		RESTILE	-	
		JOHNSON	.	
15.	ACID /ALKALI RESISTANCE TILES, AR BRICKS, ARCEMENT (POTASSIUM SILICATE BASED CEMENT MORTAR, PHENOLIC BASED RESIN CEMENT) AR BITUMASTIC	CARBORANDUM UNIVERSAL	CHENNAI	
		PELICAN	BHIWADI	
		CAMBRIAN	ALWAR	
		KERATECH	VADODARA	
		CHAMPION CERAMICS	CHAMPA	
		SUNSHINE CERAMICS	CHAMPA	
		MAHAKOSHAL POTTRIES	KATNI	
		PERFECT ACID WARE	JABALPUR	
		BABA BAIDNATH REFRACTORIES	PURULIA	

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16.	FIRE PROOF DOORS	NAVAIR INTERNATIONAL LTD.	NEW DELHI	
		SHAKTI MET DOOR	HYDERABAD	
		SUPER STEEL	DELHI	FOR SINGLE LEAF ONLY
		SIGNUM FIRE PROTECTION	NAGPUR	
		RADIANT SAFE DOORS	AHMEDABAD	
17	PARTICLE BOARDS, PLYWOOD, MDF	NOVAPAN	-	
		ECOBORD	-	
		BHUTAN BOARD	-	
		KITPLY	-	
		CENTURY	-	
		GREEN PLY	-	
		DUROPLY	-	
		MERINO	-	1
18	ALUMINUM SECTIONS	HINDALCO	-	
		INDALCO		
		BALCO (VEDANTA)	-	
		NALCO	-	
		JINDAL	-	
19	HIGH SOLID CONTENT LIQUID APPLIED URETHANE BASED ELASTOMERIC MEMBRANE FOR WATER PROOFING	STP	-	
		IWL INDIA LTD	-	
		LLOYDS	-	
		CICO TECHNOLOGIES LTD		
		MK PETRO	-	
20	SANITARY ITEMS	PARRYWARE	-	
		HINDWARE	-	
		SEABIRD		
		ORIENT		
		HINDUSTAN		
		CERA		
21	CP BRASS TAP AND OTHER SANITARY FITTINGS	GEM	-	
		PARKO	-	
		JAQUAR	-	
		MARC	-	
22	POLYTHENE WATER STORAGE TANKS	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
23	NEOPRENE BELLOW STRAPS	CORI	CHENNAI	
		RESISTOFLEX	NOIDA	
		DWREN	KOLKATA	
24	RCC PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	

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25	POLYCARBONATE SHEETS	GE PLASTIC (SABIC)	–	
		BAYER (MAKROLON)	–	
26	ELECTRICALLY OPERATED HOIST (5T/2T)	CONSOLIDATED HOIST	SATARA	
		HERCULES HOIST	RA1GARH	
		GRIP ENGG	FARIDABAD	
		EDDY CRANE	PUNE	
		ARMSHEL	BANGLORE	
		CENTURY CRANE	PALWAL	
		ELECTROTHERAPY	HOWRAH	
		TRACTEL TRIFFER	PALWAL	
		ALFA CRANES	ALWAR	
		REVA HOIST	FARIDABAD	
27	STOP LOG GATES, TRASH RACK AND LIFTING BEAM	GENERAL MECHANICAL WORKS	BARODA	
		TRIVENI	NOIDA	
		MACMET	KOLKATA	
		PRADEEP STRUCTURES	HOWRAH	
		RED FAG	HYDERABAD	
		BSBK ENGG	NOIDA	
28	PTFE BEARING ELASTOMERIC BEARING	ALL CURRENT MORTH/RDSO APPROVED VENDORS		
29	FABRIC EXPANSION COMPENSATOR	KELD ELLENTOFT INDIA LTD	CHENNAI	
		EAGLE BURGMANN KE PRIVATE LTD	CHENNAI	
30	MINERAL WOOL FOR THERMAL INSULATION	ROCKWOOL INDIA LTD.	HYDERABAD	Subject to. carrying out K-value test at CBRI Roorkee / NTPC approved lab.
		ROCKWOOL INDUSTRIES	BHILA1	
		LAP INUS	MALANPUR (MP)	
		M1NWOOL	RAJANANDGAON	
		LLOYD INSULATION	BHILAI	
		U.P. TWIGA	BULENDSHAHAR	
31	GEOTEXTILE	GARWARE WALL ROPES Ltd	PUNE	
		TENCATE GEOSYNTHETICS ASIA	MALAYSIA	NON WOVEN
32	GEOMEMBRANE (HDPE LINER)	D P WIRES PVT. LTD	RATLAM	



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33	CI PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE		
34	COAL TAR ANTICORROSIVE COATING	RUSTECH	KOLKATA	
		PORWAL INDUSTRIES	RAIPUR	
		MP TAR	BHILAI	
		STP UNITED	JAMSHEDPUR	
35	ELASTOMERIC POLYURETHANE COATING	CIPY	PUNE	
		AMCHEM	NOIDA	
		E. WOOD. (APPLICATOR: PSL HOLDING, INDIA)	UK	
		CICO TECHONOLOGIES LTD	GURGAON	
36	HIGH PERFORMANCE MOISTURE COMPATIBLE CORROSION RESISTANT COATING SYSTEM	CECRI LICENSED SOURCES		
37	MS PIPES (IS:3589, WELDED PIPES)	BIS APPROVED SOURCES HAVING VALID BIS LICENCE		
38	PVC COATED CHAIN LINK FENCING & REINFORCED BARBED TAPE	SAUDAGAR MAC MAMMANLAL PVT LTD		
		MECAFERRI		