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This volume shall be construed as part of tender document and shall be read along-with others volumes of tender. Unless otherwise specified, in case of any conflict or inconsistency between the general and technical conditions, the same shall be brought out by the bidder in writing to BHEL for clarification during pre-bid discussions, **if applicable**; 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
1.0	PROJECT SYNOPSIS AND GENERAL INFORMATION
1.1	BRBCL is setting up a coal based 4x250 MW Thermal Power Project at Nabinagar, Dist: Aurangabad, Bihar. 1. OWNER : BHARTIYA RAIL BIJLEE COMPANY LIMITED (BRBCL) 2. PROJECT TITLE : NABINAGAR THERMAL POWER PROJECT 3. PROJECT RATING : 4X250 MW 4. LOCATION : NABINAGAR, DIST-AURANGABAD , BIHAR 5. NEAREST RLY STN : DEHRI-ON-SON (30 KM FROM PROJECT LOCATION) 6. NEAREST PORT : PARADIP 7. NEAREST AIRPORT : GAYA (100 KM FROM PROJECT LOCATION) 8. ROAD APPROACH : NH-2 (25 KM FROM PROJECT LOCATION) 9. LATTITUDE : 24°42'30" N 10. LONGITUDE : 84°05'36" E 11. AVG ELAVATION : 138 MTR. 12. AVG TEMP : 40-50°C DURING SUMMER 13. AVG RAINFALL : 50-75 CM
2.0	SITE VISIT The contractor should visit project site and acquire full knowledge and information about conditions prevailing at site and in & around the plant premises, together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid.
3.0	NAME OF WORK COLLECTION / LOADING / UNLOADING/ TRANSPORTATION OF MATERIALS FROM BHEL / CLIENT'S STORES / STORAGE YARDS TO SITE OF WORK, ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION FINAL PAINTING AND HANDING OVER OF FLUE GAS DESULPHURIZATION SYSTEM (FGD) AT 4 X 250 MW, BRBCL NABINAGAR THERMAL POWER PROJECT.
4.0	SCOPE OF WORK
4.1	The scope broadly covers providing labour, supervision, materials (except those which will be supplied by BHEL free of cost), T&Ps, consumables etc as per the relevant portion of the technical specifications and terms & conditions of tender taking into account all clarifications, confirmations and agreements till date for Complete work of handling including receipt of materials from BHEL/Client's stores/storage yard, arranging their issue, site transportation, temporary storage prior to erection, if required, cleaning, transportation to site preservative painting, pre-assembly erection, alignment, welding, leveling, adjustment, chipping & leveling of foundation, all pre-commissioning tests, commissioning, start-up and trial operation and handing over of total Flue Gas Desulphurisation Plant of 4 X 250 MW, BRBCL Nabinagar Thermal Power Project., Bihar. Detailed scope is as per followings:
4.1.1	Supply of raw materials & fabrication of auxiliary support, small beam & inserts, share keys etc., Erection, testing, commissioning, trial run and handing over of the FGD system (Structural & Mechanical) as per the tender specifications. FGD system mainly consists of Absorber tower along with oxidation blowers, booster fans, Lime stone grinding and slurry preparation system consist of

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	<p>wet ball mills , lime stone silos , slurry pumps, Gypsum dewatering system, associated piping, other auxiliaries i.e Fire protection system as per followings:</p> <ol style="list-style-type: none"> 1. Absorber system 2. Common limestone grinding & slurry preparation system. 3. Common Gypsum dewatering system. 4. Auxiliary absorbent tank – for storage of absorber slurry of one unit. 5. Process water & cooling water storage & pumping system. 6. Sump & sump pumps 7. Elevator 8. Booster fans 9. Structural steel (for absorbers, tanks & ducting)
4.2	The scope of work under these specifications for Erection, testing, commissioning, trial operation & handing over of FGD system(Mechanical), fire protection system and ECW system of Four (4) Units of 250 MW. Scope of work broadly consists of but not limited to following:
4.2.1	Handling of Materials at BHEL / Client's Stores / Storage Yard and transportation to site of Erection, Testing & Assistance for commissioning and Trial Operation including supply and application of final Painting of FGD system(Mechanical), fire protection and ECW system etc.,
4.2.2	Tapping off of Duct from existing Flue Gas Duct up to Booster Fan inlet gate with related supports for One Unit. Scope involves following
4.2.2.1	Removal of Insulation (Cladding sheet & Insulation wool) at three locations per Unit to facilitate for cutting & removal of existing duct for erection of bypass damper (1 location) & tap off ducts (2 locations).
4.2.2.2	Cutting & removal of portion of existing duct.
4.2.2.3	Making suitable scaffolding arrangement to reach out at the duct location for safely removal of Insulation & cutting & removal of duct portion.
4.2.2.4	Shifting of removed Insulation materials & removed duct plates from erection site to BHEL/NTPC yard.
4.2.2.5	Erection, alignment, welding & NDT of duct/damper supporting structures.
4.2.2.6	Erection, alignment, welding & NDT of tap off duct including booster Fan inlet gates & bypass damper.
4.2.2.7	Erection, alignment, welding & NDT of tap off duct & booster Fan Inlet gate supports.
4.2.2.8	Patch work on Insulation at removed area to make it suitable for operation.
4.3	The work to be carried out at quoted / accepted rates by the Contractor under the scope of these specifications covers the complete work of handling, loading and transporting of materials from project stores sheds / storage yards to site of erection or preassembly yard and unloading at pre-assembly area/erection site, checking, cleaning chipping and leveling of foundations, providing packers and shims/pre-assembling of equipment at the preassembly yard, inspection, minor rectification, preservation, erection, leveling, and other adjustments, cutting, edge / surface preparation, welding, grinding, radiography, LPI/ MPI/ UT testing wherever needed, heat treatment, carrying out air tightness test by soap solution / kerosene, hydraulic test, including supply and application of final painting.
4.4	The quantities indicated in the tender specification are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional product group also, if included at a later date integral to the main scope of work / package envisaged. The work executed shall be measured and priced as per the unit rate arrived at for each work area as mentioned in the relevant clauses.
4.5	The quantities indicated in the tender specification are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional product group also, if included at a later date integral to the main scope of work / package envisaged. The work executed shall be measured and priced as per the unit rate arrived at for each work area as mentioned in the relevant clauses.
4.6	The PG wise breakup of FGD and Auxiliaries etc. are indicated in the relevant chapters of this tender specification, but the contractor is required to erect actual tonnage which may be necessary to complete the work in all respects as detailed in the tender specifications, for which payments shall be released on finally settled rates. The weights and dimensions of material shown are approximate and are liable to vary. No increase in quoted / accepted rates / prices shall be allowed due to change in weights and dimensions of the equipment / materials.
4.7	The weights given in the Price Schedule & other related annexures are approximate and these are subject to change as per site conditions.

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4.8	During the course of execution of work, certain rework / modification / rectification / repairs / fabrication etc will be necessary on account of feedback from various relevant sources, and also on account of design discrepancies/ alterations, manufacturing defects, site operations/ maintenance requirements. Contractor shall carry out such rework / modification / rectification / fabrication / repairs etc promptly and expeditiously. Daily log sheets indicating the details of work carried out, man-hours etc shall be maintained by the contractor and got signed by BHEL engineer every day. Claims of contractor, if any, for such works will be dealt as per conditions of contract and payments will be released as per the agreed rates.
4.9	Supervisors / Engineers, consumables etc., required for the scope of work shall be provided by the contractor. All the expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause. The contractor's quoted rates should be inclusive of all such contingencies.
4.10	It shall be specially noted that the contractor's labour and staff may have to work round the clock to meet the completion schedules / plans, which may involve payment of considerable overtime. The contractor's quoted rates should be inclusive of all such contingencies.
4.11	The terminal points can be inferred from the relevant drawings and any further clarifications can be obtained / decided by BHEL and that is final and binding on the contractor for deciding the scope of work and effecting the payment for the work done up to the terminals. Carrying out work as per the specification between equipments constituting terminal points, whether the terminal equipments fall within the scope of work/specification, contractor shall carry out the terminal joints at either end. Also where the piping connection to the terminal points involve flanged joints, matching of flanges, fixing gaskets, bolting and tightening as per BHEL Engineers instructions is in the scope of work. In case piping connected to equipment, matching of flanges for achieving the parallelism and alignment at the equipment end, by suitably resorting to heat correction or other method as instructed by BHEL Engineer, with in the quoted rate.
4.12	The work shall conform to dimensions and tolerances given in various drawings and quality manuals provided by BHEL. If any portion of work is found to be defective in workmanship not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost, failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be effected from contractor's bill towards expenditure incurred including BHEL's overhead charges.
4.13	The work covered under this specification is of highly sophisticated nature requiring the best quality of workmanship, engineering and construction management. The contractor should ensure timely completion of the work. The contractor must have the adequate quantity of tools, construction aids, equipments, etc., in his possession. He must also on his rolls adequate trained, qualified and experienced supervisory staff and skilled personnel.
4.14	Contractor shall execute the work as per sequence and procedure prescribed by BHEL at site. The erection manuals for FGD system, which are available with BHEL site office are to be referred for compliance and guidance before taking up the work. Any failure to comply with the above might lead to rework and the cost for the same shall be borne by the contractor only. BHEL engineer, depending upon the availability of materials, fronts etc., will decide the sequence of erection and methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the method of erection adopted in erection of similar jobs or for any reason whatsoever.
4.15	Contractor has to work in close co-ordination with other erection agency at site. BHEL engineer will co-ordinate area clearance. In a project of such magnitude, it is possible that the area clearance may be less/more at a particular given time. Activities and erection program have to be planned in such a way that the milestone events are achieved as per schedule/ plans. Contractor shall arrange & augment the resources accordingly.
4.16	No member of the already erected structure/ platform, pipes, grills, platform, other component and auxiliaries should be cut without specific approval of BHEL engineer.
4.17	The storage yard is located within the plant boundary. All materials have to be transported from storage yard to construction area by the contractor at his own cost.
4.18	FGD system trial run, resolving any deficiencies observed and handing over the FGD system to customer M/s NTPC.
4.19	BRIEF DESCRIPTION OF THE FGD SYSTEM
4.19.1	The FGD system shall be based on Wet Limestone Forced Oxidation process. Each unit shall be provided with an independent absorber.

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4.19.2	Gas from terminal point on ID fan discharge duct shall be taken directly to the absorber through Booster Fans. In the absorber, SO ₂ in flue gas shall be removed by a spray of recirculating slurry, pumped by slurry recirculation pumps.
4.19.3	Compressed oxidation air shall be blown through the slurry in the oxidation tank, to oxidize the Calcium sulphite to gypsum.
4.19.4	Clean gas from the absorber shall be taken to the Wet Chimney through three stage mist eliminators.
4.19.5	Limestone to the absorbers of the units shall be supplied by a wet limestone grinding system, common for the units. Limestone shall be fed to the Limestone day silos which in turn will feed the Limestone to wet ball mill through a gravimetric feeder.
4.19.6	The gypsum from the absorber(s) shall be pumped by dedicated gypsum bleed pumps to a common Gypsum Dewatering system consisting of two streams (2x100%) of primary and secondary hydrocyclone and vacuum belt filters for gypsum dewatering. The water removed from the absorber shall be recycled to the absorbers. The waste water from the system shall be collected and neutralized using lime and neutralized effluent shall be pumped at required pressure to waste water terminal point.
4.20	The brief list of the major equipment to be erected under the FGD system but not limited to following:
4.20.1	Absorber System along with supporting structures
4.20.2	Booster Fans & isolation gates
4.20.3	Tanks of various sizes
4.20.4	Lime stone grinding and slurry preparation system consist of lime stone silos, bunker, gravimetric feeder, wet ball mills, hydrocyclones
4.20.5	Slurry pumps (Absorber Slurry recirculation pumps, Gypsum Bleed pumps , limestone Slurry feed pumps)
4.20.6	Gypsum Dewatering system consists of Vacuum belt filter, hydrocyclones
4.20.7	Process water and cooling water storage system
4.20.8	Thermal Insulation and cladding sheets
4.20.9	Sump Pumps
4.20.10	Piping system
4.20.11	Equipment Cooling water System (PHEs, DMCW pumps)
4.20.12	Misc platforms, galleries, handrails
4.20.13	Fire Protection System including hydrant , MVWS,HVWS
4.20.14	Equipment Handling System
4.20.15	All required structures for equipments & ducting
4.20.16	All shop fabricated structural steel including materials handling of the same.
4.21	Tentative weight to be erected for the FGD System shall be 21343 MT (excluding supply of raw materials & fabrication of auxiliary support, small beam & inserts, share keys etc.), and detailed break up indicated in Annexure-II .
4.21.1	The contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commission above system and complete the work in all respects as detailed in tender specifications, for which payments shall be released on finally accepted tonnage rates. The contractor undertakes to erect / commission actual quantities as per instruction of the BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments shall also be regulated for the same.
4.21.2	The customer and / or their Consultant may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works, without any cost implications to the BHEL. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL Engineer, without any cost implication to BHEL.
5.0	DEVIATIONS
	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.

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6.0	<p>DEWATERING</p> <p>Contractor shall ensure at all times that his work area & adjacent approach / access roads are free from accumulation of water, so that the materials and erection equipment are safe and the erection / progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL. No separate payments for dewatering of subsoil, surface water or catchments water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL.</p>
7.0	GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)
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.
8.0	GENERAL SERVICES TO BE RENDERED BY THE BIDDER
8.1	Deployment of all tools & tackle, construction machinery, transportation vehicles and all other implements in adequate number and size, appropriate for the construction work to be handled under scope of this specification except otherwise specified.
8.2	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.
8.3	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.
8.4	As part of overall project management activity, the contractor shall be responsible for proper co-ordination of 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.
8.5	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.
8.6	The contractor shall supply all skilled, semi-skilled and unskilled workmen required for all works of handling and transportation from site store to erection site, 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

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	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.
8.7	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.
8.8	The contractor shall also furnish daily manpower report showing by classification the number of employees engaged in various categories of work a progress report of work as required by BHEL engineer.
8.9	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.
8.10	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.
8.11	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 erection, commissioning and testing period. Contractor's quoted rate shall include all these contingencies.
8.12	Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.
9.0	PROTECTION
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 instrumentations 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 to be supplied by the contractor within the quoted rate.
10.0	GENERAL GUIDELINES FOR FIELD ACTIVITIES
10.1	The contractor shall execute the works in a professional manner so as to achieve the target schedule without any sacrifice on 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 BHEL engineer shall hold weekly meeting of all the contractors working at site at a time and a place to be designated by the engineer to discuss interface issues. 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

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	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 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.
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	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.
11.0	QUALITY CONTROL & QUALITY ASSURANCE
11.1	INSPECTION & FIELD QUALITY ASSURANCE
11.1.1	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.
11.1.2	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.
11.1.3	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.
11.1.4	A daily log book (with proper indexing) should be maintained by every supervisor / engineer of contractor, for respective area of work, on the job for detailing and incorporating alignment/ clearance / centering / levelling readings and inspection details of various equipment, etc. This log book shall be always accessible to BHEL engineers. High pressure welding (as applicable under the scope of this contract) details like serial number of weld joints, welders name, date of welding, details of repair, heat treatment etc. will be documented in welding log as per BHEL Engineer's instructions. Record of radiography (as applicable under the scope of this contract) containing details like serial number of weld joints, date of radiography, repairs, if any, re-shots etc shall also be maintained as per BHEL Engineer's instructions. Record of heat treatments (as applicable under the scope of this contract) performed shall be maintained as prescribed by BHEL.
11.1.5	The contractor has to take prior permission / approval before deployment of NDE & Heat Treatment agencies at site as per BHEL document no. PP-QLY-AA-DC-106/01-20. The contractor's employees involved in NDE & Heat treatment job must be qualified & experienced as per the requirement of the above document.
11.1.6	The performance of welders (as applicable under the scope of this contract) will be reviewed from time to time as per the BHEL standards. Welders' performance record shall be furnished periodically for scrutiny of BHEL's Engineer. Currently, BHEL follows online Welder Performance Monitoring System. Contractor shall extend necessary support, as deemed fit by BHEL site-in-charge, regarding data entry into the system.

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	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.
11.1.7	Only welders duly authorized by BHEL / customer / consultant after welder qualification test as per ASME Sec-IX / AWS D1.1 (as applicable) shall be engaged on the work. All the welders shall carry identity cards as per the proforma prescribed by BHEL / Customer / Consultant. High Pressure welders and welders of special materail viz. C276, Ti, etc., must be trained & tested by experts from BHEL-WRI/ other units. Necessary infrastructure for welder traning & testing, as per BHEL's instruction, to be arranged by the contractor without any extra cost to BHEL.
11.1.8	Any re-laying or re-termination of cables / re-erection of instruments / recalibration of instruments etc. required due to contractor's mistake and found at any stage inspection, shall be carried out by the contractor at no extra cost. Repair / rectification procedure to be adopted to make any job acceptable shall be subject to the approval of BHEL. Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next weeks inspection plans. Site in-charge of the contractor along with OAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
11.1.9	Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next weeks inspection plans. Site incharge of the contractor along with OAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
11.2	REQUIREMENT OF ISO 9001
11.2.1	BHEL: PSER is accredited with ISO 9001 certification and as such this work is subject to various audits to meet ISO 9001 requirements.
11.2.2	The basic philosophy of the Quality Management System under ISO 9001 is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product / procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers / vendors of various products / services contributing in the work are also considered as part of the quality management system. 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.
11.2.3	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.
11.2.4	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.
11.3	MMEs / MMRs
11.3.1	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. Retesting / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such MMEs so that work does not suffer when the particular equipment / instrument is sent for calibration. Also if any MMEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument, failing which BHEL may deploy MME and retake the readings at Contractor's cost.
11.3.2	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

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	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.
11.3.3	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.
11.3.4	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.
11.3.5	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.
11.4	INSPECTION BY TS / FES / QA ENGINEERS OF BHEL UNITS / ENGINEERING CENTRES
11.4.1	Apart from day-to-day inspection by BHEL Engineers stationed at Site and Customer's Engineers, stage inspection of equipment under erection and commissioning at various stages may also be conducted by teams of Engineers from Field Engineering Services of BHEL's Manufacturing Units, Quality Assurance teams from Field Quality Assurance, Unit/Factory Quality Assurance and Commissioning Engineers from Technical Services etc. Contractor shall arrange all labour, tools and tackles etc along with proper access for such stage inspections free of cost.
11.4.2	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.
11.5	CONFORMANCE TO THE STATUTORY REQUIREMENTS (AS APPLICABLE UNDER THE SCOPE OF THE CONTRACT)
11.5.1	<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"> 1) Inspectorate of Steam Boilers and Smoke Nuisance 2) Electrical Inspector 3) Factory Inspector, Labour Commissioner, PF Commissioner and other authorities connected to this project work. <p>The scope includes getting the approvals from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per BHEL Engineer's instructions, arranging materials for ground inspection, taking rub outs for stamping of the pressure parts / pipes to be offered for inspection, submitting co-related inspection reports, documents, radiographs etc and following up the matter with them. Contractor shall also make all arrangements for offering the Products / Systems for inspection at location, as applicable, to the concerned authority</p>
11.5.2	Contractor should be qualified to execute pressure parts & piping work coming under the purview of IBR or Competant Inspecting Authority, for which he should register himself with CIB of state concerned / Competant Inspector. Contractor also should be aware of the latest Boiler regulations and Electricity Act, including the amendments thereof, as applicable under the scope of this contract.
11.5.3	Contractor shall comply with 'Qualification Tests for welders engaged in welding of Boilers and Steam Pipes under Construction, Erection and Fabrication at Site in India and in repairing Boilers and steam pipes by welding' in line with Chapter XIII of Indian Boiler Regulations- 1950, for testing his welders / men / workers, including all associated fees, procedures, required instruments and equipment and their calibration there of. It shall be contractor's responsibility to obtain approval of Statutory Authorities, wherever applicable, for the conducting of any work which comes under the purview of these authorities, at his cost.
11.5.4	<p>The following fees shall be excluded from scope of Contractor:</p> <ol style="list-style-type: none"> 1. Registration Fee as per Regulation 385 of Chapter IX of Indian Boiler Regulations-1950 or Registration Fee as per prevailing statutory boiler regulations. 2. Fees for inspection of Boiler at the site of Construction as per Regulation 395 A, sl no 4 of Chapter IX of Indian Boiler Regulations- 1950.

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	However, all other fees like visit fees charged by the Boiler Inspector and other arrangements for his visit or visits till satisfactory completion of work, shall be included in scope of Contractor.			
11.6	STORAGE & PRESERVATION OF WELDING ELECTRODES & OTHER BHEL-ISSUED MATERIAL			
11.6.1	The contractor shall be responsible for storage & preservation of welding electrodes & other BHEL-issued materials as per BHEL Storage & Preservation Guidelines / Instructions.			
11.7	PENALTIES ON VENDORS / SUB-CONTRACTORS AGAINST NON-COMPLIANCE OF QUALITY NORMS			
Sl. No.	Nature of Non-compliance	Penalty for Domestic Project	Penalty for Export Project	Remarks
GENERAL				
11.7.1	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
11.7.2	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
11.7.3	Not attending quality meeting of BHEL by nominated member of vendor / sub-contractor	Rs. 2,000.00	\$32.00	Per meeting
CALIBRATION				
11.7.4	Use of MMEs without valid calibration certificate	Rs. 1,000.00	\$16.00	Per equipment per instance
11.7.5	Use of NDT equipment, welding equipment without having valid calibration certificate / condition not as per requirement	Rs. 1,000.00	\$16.00	Per equipment per instance
WELDING & NDT				
11.7.6	Unqualified welders carrying out welding / tack welding	Rs. 1,000.00	\$16.00	Per welder per instance. (Gatepass of the person shall be withheld)
11.7.7	Not using portable oven for welding consumables	Rs. 500.00	\$8.00	Per welder per instance. (The consumables in the oven shall be confiscated)
11.7.8	Not using electrodes pre-baked in baking oven	Rs. 500.00	\$8.00	Per instance. (The subject consumables shall be confiscated)
11.7.9	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)
11.7.10	Non-removal of welding slag and spatters after welding	Rs. 500.00	\$8.00	Per joint
11.7.11	Not using NDT equipment as prescribed in the manual / FQP / guidelines / Contract	Rs. 1,000.00	\$16.00	Per equipment per instance
11.7.12	Welder doing welding without valid job card	Rs. 500.00	\$8.00	Per instance
11.7.13	Discrepancy observed in the weld joints identified by BHEL / Customer for RT vs RT film offered	Rs. 2,000.00	\$32.00	per joint

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MATERIAL MANAGEMENT				
11.7.14	Non-maintenance of grid pillar marking	Rs. 200.00	\$3.00	Per location week
11.7.15	Mismatch of location of material in store area w.r.t. location mentioned in stock register	Rs. 500.00	\$8.00	Per instance
11.7.16	Non-compliance of Preservation of material as per storage & preservation manuals	Rs. 1,000.00	\$16.00	Per equipment
11.7.17	Not offering received material for verification within stipulated time as per contract	Rs. 500.00	\$8.00	Per instance
PAINTING & ALLIED WORKS				
11.7.18	Not using primer / paints of approved make and as per Specifications	Rs. 1,000.00	\$16.00	Per instance
11.7.19	Painting without proper surface preparation as per approved schedule / drawing / FQP	Rs. 500.00	\$8.00	Per instance
PROTOCOLS & LOG SHEETS				
11.7.20	Delay in preparation of Protocols / Logsheets as per approved FQP within 3 days of completion of checks	Rs. 200.00	\$3.00	Per protocol per day delay
INSPECTION OF BOUGHT-OUT ITEMS / CONSUMABLES				
11.7.21	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
11.7.22	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.				
12.0	HEALTH, SAFETY & ENVIRONMENT			
12.1	General			
12.1.1	The contractor shall comply with all the requirements of "The Building and Other Construction Workers (Regulation of Employment, Conditions of Service) Act," 1996 and its Central Rule 1998 / State Rules and any other statutory requirements as applicable.			
12.1.2	The Contractor shall follow NTPC Safety Rules as issued from time to time with respect to safety in construction & erection.			
12.1.3	The contractor shall have the approved Safety, Health and Environment (SHE) Policy in respect of Safety and health of Building Workers and it shall be circulated widely and displayed at conspicuous place in Hindi and local language understood by the majority of the workers. A copy of the safety policy should be submitted to Engineer in charge.			
12.1.4	The contractor shall submit the safety plan comprising of methods to implement the Safety Policy/ Rules, Risk assessment and ensuring Safety at work areas, Safety audits, inspections and its compliance, Supervision and Responsibility to ensure Safety at various levels, Safety training to employees, review of Safety and accident analysis, ensure Health and Safety Procedures to prevent accidents to Engineer I/c for approval as per the format of Safety plan as annexed at Annexure - I.			

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12.1.5	The Contractors shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to the Employer or to others, working at the Site.
12.1.6	All equipments used in construction and erection by the contractor shall meet BIS I International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipments shall be strictly operated and maintained by the contractor in accordance with manufacturer's operation manual. The contractor should also follow Guidelines/Rules of the Employer in this regard.
12.1.7	The Contractors shall provide suitable latest Personal Protective Equipments of prescribed standard to all their employees and workmen according to the need. The Engineer I/c shall have the right to examine these safety equipments to determine their suitability, reliability, acceptability and adaptability. The contractor should also ensure these before their use at worksite.
12.1.8	The Contractor shall provide safe working conditions to all workmen and employees at his workplace including safe means of access, railings, stairs, and ladders, scaffolding, work platforms, toe boards etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection of scaffolds, access, work platforms etc. shall be good and the contractor shall use standard quality of material.
12.1.9	The Contractor shall follow and comply with all the Safety Rules, standards, code of practices of NTPC and relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any protest or contest or reservation. In case of any unconformity between statutory requirement and the Safety Rules of the Employer referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent. As and when required he can refer / obtain copy of NTPC safety documents as stated above.
12.1.10	The contractor shall have his own arrangements with nearby hospitals for shifting and treatment of sick and injured. The medical examination of the workers employed in hazardous areas shall be conducted as per Rule 223 Of The Building and Other Construction Worker (Regulation of Employment and Condition of Service) Central Rule 1998 Their health records shall be maintained accordingly and to be submitted to Engineer I/c when asked for. If any worker found suffering from occupational health hazard, the worker should be shifted to suitable place of working and properly treated under intimation to Engineer I/c. The medical fitness certificate to be submitted to Engineer (I/c).
12.1.11	First Aid boxes equipped with requisite articles as specified in the Rule 231 of The Building and Other Construction Worker (Regulation of Employment and Condition of Service) Central Rule 1998 shall be provided at construction sites for the use of workers. Training has to be provided on first aid to workmen & office bearers working at site.
12.2	Emergency Action Plan The contractor shall prepare an emergency action plan approved by his competent authority to handle any emergency occurred during construction work. Regular mock drills shall be organized to practice this emergency plan. The Emergency Action Plan should be widely circulated to all the employees and suitable infrastructure shall be provided to handle the emergencies.
12.3	Scaffolding The contractor shall take all precautions to prevent any accidental collapse of scaffolding or fall of persons from scaffolding. The contractor should ensure that scaffoldings are designed by a competent person and its erection and repairs should be done under the expert supervision. The scaffolding shall meet the required strength and other requirements for the purpose for which the scaffold is erected. The material used for scaffold should conform to the BIS / International standards.
12.4	Opening The contractor shall ensure that there is no opening in any working platform/any floor of the building, which may cause fall of workers or material When ever an opening on a platform/any floor of the building is unavoidable, the opening should be suitably fenced and necessary measures for protection against falling objects or building workers from such platform are taken by providing suitable safety nets, safety belts or other similar means.
12.5	Explosives The contractor shall take all precautions while handling, using, storing or transporting of all explosives. Before usage of any explosive necessary warning / danger signals be erected at conspicuous places to warn the workers and general public. The contractor should strictly ensure that all measures and precautions required to be complied for use, handling, storing or transportation of explosives under the rules framed under the Explosives Act, 1884.
12.6	Fencing of Machinery The contractor shall provide suitable fencing or guard to all dangerous and moving parts of machinery The contractor shall not allow any of the employees to clean, lubricate, repair, adjust or examine during machinery in motion, which may cause injury to the person.
	Carrying of Excessive Weight by a Worker

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12.7	The worker shall not be allowed to lift by hand or carry over his head, back or shoulder more than the maximum limit set by the prescribed rules for the construction Workers.
12.8	<p>Dangerous and Harmful Gases / Equipment</p> <p>The contractor shall ensure that the workers are not exposed to any harmful gases during any construction activity including excavation, tunneling, confined spaces etc. The contractor should not allow any worker to go into the confined space unless it is certified by Engineer (I/c) to be safe and fit for the entry to such work place. Proper record and work permits should be followed to carry out such works.</p>
12.9	<p>Dangerous and Harmful Gases / Equipment</p> <p>The contractor shall ensure that the workers are not exposed to any harmful gases during any construction activity including excavation, tunneling, confined spaces etc. The contractor should not allow any worker to go into the confined space unless it is certified by Engineer (I/c) to be safe and fit for the entry to such work place. Proper record and work permits should be followed to carry out such works.</p>
12.10	<p>Overhead Protection</p> <p>The contractor shall ensure that any area exposed to risk of falling materials, articles or objects is roped off or cordoned off or otherwise suitably guarded from inadvertent entry of any person. Wherever there is a possibility of falling of any material, equipment or construction workers while working at heights, a suitable and adequate safety net should be provided. The safety net should be in accordance with BIS Standards.</p>
12.11	<p>Working at Heights</p> <p>All working platforms, ways and other places of construction work shall be free from accumulations of debris or any other material causing obstructions and tripping. Wherever workers are exposed to the hazard of falling into water, the contractor shall provide adequate equipment for saving the employees from drowning and rescuing from such hazards. The contractor shall provide boat or launch equipped with sufficient number of life buoys, life jackets etc. manned with trained personnel at the site of such work.</p> <p>Every opening at elevation from ground level through which a building worker, vehicle, material equipment etc. may fall at a construction work shall be covered and/or guarded suitably by the contractor to prevent such falls.</p> <p>Wherever the workers are exposed to the hazards of falling from height, the contractor shall provide full harness safety belts fitted with fall arresting systems to all the employees working at higher elevations and life line of 8 mm diameter wire rope with turn buckles for anchoring the safety belts while working or moving at higher elevations. Safety nets shall also be provided for saving them from fall from heights and such equipment should be in accordance with BIS standards.</p> <p>Wherever there is a possibility of falling of any material, equipment or construction workers while working at heights, a suitable and adequate safety net should be provided. The safety net should be in accordance with BIS Standards.</p> <p>The contractor shall provide standard prefabricated ladders on the columns where the workers are required to use them as an access for higher elevations till permanent staircase is provided. The workers shall be provided with safety belts permanent staircase is provided. The workers shall be provided with safety belts fitted with suitable fall arresting system (Fall arrestors) for climbing/getting down through ladders to prevent fall from height.</p>
12.12	<p>Handling of Hazardous Chemicals</p> <p>The Contractor will notify well in advance to the Engineer I/c of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. NTPC shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contract shall strictly adhere to and comply with such instructions. The Engineer I/c shall have the right at his sole discretion to inspect any such container or such construction plant / equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by NTPC and NTPC shall not entertain any claim of the Contractor towards additional safety provisions / conditions to be provided for / constructed.</p> <p>Further, any such decision of the Engineer I/c shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by NTPC, the Contractor shall use alternative methods with the approval of the NTPC without any cost implication to the NTPC or extension of work schedule.</p> <p>Where it is necessary to provide and / or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and / or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act 1948, and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Engineer I/c. In case any approvals are necessary</p>

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	<p>from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.</p> <p>The Contractor shall be fully responsible for the safe storage of his and his Sub- contractor's radio-active sources in accordance with BARC/DAE (Bhabha Atomic Research Centre/ Department of Atomic Energy, Govt. of India) Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, the contractor would take storage and handling of such material.</p> <p>The contractor shall provide suitable personal protective equipments to the workers who are handling the hazardous and corrosive substances including alkalis and acids.</p> <p>As a precautionary measure the contractor should keep the bottles filled with distilled water in cupboard / Boxes near work place for emergency eye wash by worker exposed to such hazardous chemicals.</p>
12.13	<p>Eye Protection</p> <p>The contractor shall provide suitable personal protective equipment to his workmen depending upon the nature of hazards and ensure their usage by the workers engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause injuries to his eyes.</p>
12.14	<p>Excavation</p> <p>The contractor shall take all necessary measures during excavation to prevent the hazards of falling or sliding material or article from any bank or side of such excavation which is more than one and a half meter above his footing by providing adequate piling, shoring, bracing etc. against such bank or sides.</p> <p>Adequate and suitable warning signs shall be put up at conspicuous places at the excavation work to prevent any persons or vehicles falling into the excavation trench. No worker should be allowed to work where he may be stuck or endangered by excavation machinery or collapse of excavations or trenches.</p>
12.15	<p>Electrical Hazards</p> <p>The contractor should ensure that all electrical installations at the construction work comply with the requirements of latest electricity acts / rules.</p> <p>The contractor shall take all adequate measures to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuits which may cause electrical hazards during the construction work. The contractor shall provide the sufficient ELCBs / RCCBs for all the portable equipments, electrical switchboards, distribution panels etc. to prevent electrical shocks.</p> <p>The contractor should ensure use of single I double insulated hand tools or low voltage i.e., 110 volts hand tools.</p> <p>The contractor should also ensure that all temporary electrical installations at the construction works are provided with earth leakage circuit breakers.</p>
12.16	<p>Vehicular Traffic</p> <p>The contractor should employ vehicle drivers who hold a valid driving license under the Motor Vehicles Act, 1988.</p>
12.17	<p>Lifting Appliances, Tools & Tackles, Lifting Gear And Pressure Plant & Equipment etc.</p> <p>The contractor shall ensure all the lifting appliances, tools & tackles including cranes etc., lifting gear including fixed or movable and any plant or gear, hoists, Pressure Plant and equipment etc. are in good condition and shall be examined by competent person and only certified shall be used at sites. Periodical Examination and the tests for all lifting / hoisting equipment & tackles shall be carried out. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer I/c or by the person authorized by him.</p>
12.18	<p>Excessive Noise, Vibration</p> <p>The contractor shall take adequate measures to protect the workers against the harmful effect of excessive noise or vibration. The noise should not exceed the limits prescribed under the concerned rules, Noise Pollution (Regulation and Control) Rules, 2000.</p>
12.19	<p>Electrical Installations</p> <p>The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other contractors under any circumstances, whatsoever, unless expressly permitted in writing by the Engineer I/c to handle such fuses, wiring or electrical equipment. Before the Contractor connects any electrical appliances to any plug or socket belonging to the other contractor or the NTPC, he shall</p> <p>i) Satisfy the Engineer I/C that the appliance is in good working condition;</p>

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	<p>ii) Inform the Engineer I/C of the maximum current rating, voltage and phases of the appliances;</p> <p>iii) Obtain permission of the Engineer I/C detailing the sockets to which the appliances may be connected.</p> <p>The Engineer I/C will not grant permission to connect until he is satisfied that:</p> <p>The appliance is in good condition and is fitted with suitable plug; having earth connection with the body.</p> <p>Wherever armored / metallic sheathed multi core cable is used, the same armored / sheathed should be connected to earth.</p> <p>iv) No repair work shall be carried out on any live equipment. The Engineer I/c must declare the equipment safe and a permit to work shall be issued by the NTPC / contractor as the case may be to carry out any repair / maintenance work. While working on electric lines / equipments whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the contractor to electricians / workmen / Officers.</p> <p>v) The contractor shall employ necessary number of qualified, full time Electricians / Electrical Supervisors to maintain his temporary electrical installation.</p> <p>The installations are provided with suitable ELCBs and RCCBs wherever required</p>
12.20	Safety Organisation
12.20.1	The contractor employing more than 250 workmen whether temporary, casual, probationary, regular or permanent shall employ at least one full time safety officer exclusively to supervise safety aspects of the equipments and workmen, who will coordinate with the NTPC Safety Officer. Further requirement of safety officers, if any, shall be guided by Rule 209 of The Building and Other Construction Worker (Regulation of Employment and Conditions of Service) Central Rule 1998. In case the work is being carried out through subcontractor, the employees / workmen of the sub contractor shall also be considered as the contractor's employees/workmen for the above purpose. In case of contractor deploying less than 250 workmen he should designate one of his Engr / supervisor or the contractor himself (if he is directly supervising the work) as safety officer in addition to his existing responsibilities. The Engr./ supervisor should get atleast 2 days safety training from any reputed organization or from NTPC before resuming the work. If already trained in past the declaration along with trg. certificate to be furnished to NTPC safety officer.
12.20.2	The name and address of such Safety Officer of the Contractor will be promptly informed in writing to the EIC with a copy to the Project Safety Officer before he starts work or immediately after any change of the incumbent is made during currency of the Contract.
12.21	Reporting of Accident and Investigation
	In case any accident occurs during the construction / erection or other associated activities undertaken by the Contractor thereby causing any near miss, minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Engineer I/C, NTPC Safety Officer with a copy to NTPC Head of Project in the prescribed form and also to all the authorities envisaged under the applicable laws.
12.22	Right to stop Work
12.22.1	The Engineer VC shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipments. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury / accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.
12.22.2	The Contractor shall not be entitled for any damages / compensation for stoppage of work, due to safety reasons and the period of such stoppage of work shall not be taken as an extension of time for Completion of the Facilities and will not be the ground for waiver of levy of liquidated damages.
12.23	Fire Protection

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	The contractor shall provide sufficient fire extinguishers at place /s of work. The fire extinguishers shall be properly maintained as per relevant BIS Standards. The employees shall be trained to operate the fire extinguishers / equipment.
12.24	<p>Penalties</p> <p>I. If the Contractor fails in providing safe working environment as per the Safety Rules of NTPC or continues the work even after being instructed to stop the work by the Engineer I/C as provided in, the Contractor shall be penalized at the rate of Rs. 25,000/- per day or part thereof till the instructions are complied with and so certified by the Engineer I/C. However, in case of accident, the provisions contained in relevant sub clause shall also apply in addition to the penalties mentioned in this sub-clause.</p> <p>II. If the Contractor does not take all safety precautions and / or fails to comply with the Safety Rules as prescribed by the Employer or under the applicable law for the safety of the plant and equipment and for the safety of personnel and the contractor does not prevent hazardous conditions which cause injury to this own employees or employees of other contractors, or NTPC's employees or any other person who are at the Site or adjacent thereto, the Contractor shall be responsible for payment of penalty to NTPC as per the following schedule:-</p> <p>a) Fatal injury or accident causing death: Penalty @10% of contract value or Rs. 5,00,000/- per person, which ever is less.</p> <p>b) Major injuries or accident causing 25% or more permanent disablement to workmen or employees: Penalty @2.5% of contract value or Rs. 1,00,000/- per person which ever is less Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923. The penalty mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Workmen's Compensation Act' 1923 and rules framed there under or any other applicable laws as applicable from time to time.</p> <p>III. If any contractor worker found working without using the safety equipment like safety helmet, safety shoes, safety belts, etc. or without anchoring the safety belts while working at height the Engineer I/c / Safety Officer of NTPC shall have the right to penalize the contractor for Rs. 200/- per person per day and such worker shall be sent out of the workplace immediately and shall not be allowed to work on that day. Engineer I/c / Safety Officer of NTPC will also issue a notice in this regard to the contractor.</p> <p>IV. If two or more fatal accidents occur at same NTPC site under the control of contractor during the period of contract and he has</p> <ol style="list-style-type: none"> (1) not complied with keeping adequate PPEs in stock or (2) defaulted in providing PPEs to his workmen (3) not followed statutory requirements / NTPC safety rules (4) been issued warning notice/s by NTPC head of the project on non observance of safety norms (5) not provided safety training to all his workmen, the contractor can be debarred from getting tender documents in NTPC for two years from the date of last accident. <p>The safety performance will also be one of the overriding criteria for evaluation of overall performance of the contractors by NTPC. The contractor shall submit the accident data including fatal / non-fatal accidents for the last 3 years where he has undertaken the construction activities Projects-wise along with the tender documents. This will also be considered for evolution of tender documents. If the information given by the contractor found incorrect, his contract will be liable to be terminated.</p>
12.25	The Contractor will make available minimum quantity of all safety equipments and safety personal protection equipments (PPEs) of required specifications as per suggestive list included bidding documents as a part of "List of minimum T & P". Further Contractor will ensure availability of additional requirement for individual worker and safety equipment as per site requirement during execution of the contract till its completion.
12.26	Award

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	If the Contractor's performance on safety front is found satisfactory i.e. without any fatal/reportable accident in the year of consideration; he may be considered for suitable award "ACCIDENT FREE SAFETY MERITORIOUS AWARD" as per scheme of the employer.
12.27	The Contractor shall abide by the following during Construction and Erection activities I. Chain pulley block shall not be used for loads more than 2 (Two) tonne. II. Hydra shall not be used for material transport. III. Cage shall necessarily be provided to Monkey ladders of height more than 4 m. IV. Fencing shall be provided to all Electrical Distribution boards and transformers etc.
12.28	Further details of applicable HSE norms shall be as per HSE Doc. No.: HSEP:14-ER, Rev-01 Dated 08/05/2020, OPERATIONAL CONTROL PROCEDURE, Doc. No.: HSEOCP: 61A , Rev. No.: 00 dated 27.04.2020 & OPERATIONAL CONTROL PROCEDURE , Doc. No.: HSEOCP: 61 , Rev. No.: 01 dated 01.06.2020 of Tender.
13.0	LAND
13.1	Availability of land within plant boundary is very limited and the contractor has to plan & use the existing land considering the use of land by other contractors and the storage of plant machineries and materials. The existing land shall be shared by all erection agencies. The same will be reviewed by BHEL and allotted to the extent available/ considered necessary free of cost. Contractor shall develop these areas for their site office, their own stores etc. Bidder must visit site to assess site condition, prior to quoting.
13.2	Levelled area for storage area for BHEL's material shall be provided as per availability free of cost.
13.3	Land for labour colony shall be arranged by successful bidder at their own. The contractor shall construct labour colony / hutment as per his requirements after obtaining approval of formalities from statutory body. Further, contractor must ensure minimum HSE norms and hygienic sanitary conditions in his labour colony.
13.4	The contractor will be responsible for handing back all lands, as handed over to him by BHEL/NTPC.
14.0	WATER
14.1	BHEL will provide single point supply for construction & drinking water inside the project premises for office free of cost.
14.2	Further necessary network for construction & drinking water system shall be done by the bidder at his own cost.
14.3	Contractor should arrange for water for labour colony of their own.
14.4	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 at their own cost.
14.5	Contractor will have to arrange for storage of water to meet the day-to-day requirement.
14.6	The availability of water (construction as well as drinking) 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.
15.0	ELECTRICITY
15.1	BHEL shall provide construction power free of charge at 415V level at one point. Contractor has to make their own distribution arrangement to draw electricity. Overall area illumination will be provided by BHEL. However, for night working contractor should arrange illumination as and when required by them.
15.2	The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/ T&Ps are deployed.
15.3	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.
15.4	Bidder will have to arrange sufficient illumination at their own work areas.
15.5	The contractor should ensure that the work in critical areas is not held up in the event of power breakdown. In the event of breakdown in the electric supply, if the progress of work is hampered, it will be the responsibility of the contractor to step up the progress of work after restoration of electric supply so that overall progress of work is not affected.

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15.6	The contractor shall have to make arrangement at their own cost for illumination that will be required in the working area for execution of the work & safety of workmen.
15.7	Contractor shall make arrangement of electricity of their own for labour colony.
16.0	CONSUMABLE
16.1	Such of those consumables as indicated as consumables provided by BHEL alone will be provided to the contractor by BHEL free of charge for erection activities. Other required consumables like electrodes, all gases, and other materials for this scope of work are to be arranged by the contractor at their cost.
16.2	All the required electrodes (in his scope) as approved by BHEL shall be arranged by contractor at his cost. It shall be the responsibility of the contractor to obtain prior approval of BHEL, before procurement regarding, suppliers, type of electrodes etc. On receipt of the electrodes at site, it shall be subject to inspection and approval by BHEL. The contractor shall inform BHEL details regarding type of electrodes, batch number and date of expiry etc.
16.3	Only TIG welding wires for CS, AS & SS welding will be supplied by BHEL free of cost for Boiler for applicable Pressure Parts as provided by manufacturing units. All other electrodes including stainless steel electrodes required for shall be arranged by the contractor at his cost. However, BHEL will provide imported electrodes as provided by manufacturing units. The bidder shall use the Customer approved quality welding electrodes only. The utilization of the TIG welding wires issued by BHEL shall be duly accounted for exercising maximum care and ensuring economical usage for minimum wastage. If during erection, it is found that the consumption of filler wire is more than the actual requirement due to improper usage, the cost for the additional quantity so consumed shall be recovered from the contractor.
16.4	The contractor shall provide within finally accepted price / rates, all consumables like welding electrodes (including alloy steel and stainless steel), all gases (inert, welding, and cutting), soldering material, dye penetrants, radiography films. Other erection consumables such as tapes, jointing compound, grease, mobile oil, M-seal, Araldite, petrol, CTC / other cleaning agents, grinding and cutting wheels are to be provided by the contractor. Steel, H&S, packers, shims, wooden planks, scaffolding and pre-assembly materials, hardware items etc. required for temporary works such as supports, scaffoldings, bed are to be arranged by him. Sealing compounds, gaskets, gland packing, wooden sleepers, for temporary work, required for completion of work except those which are specifically supplied by manufacturing unit are also to be arranged by him.
16.5	All the shims, gaskets and packing, which go finally as part of equipment, shall be supplied by BHEL free of cost.
17.0	TEST CERTIFICATES Necessary test certificates of all materials supplied by contractor are to be produced to BHEL prior to use of those materials.
18.0	PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT To meet the need of construction management at site, contractor shall provide the following services within quoted/ accepted rates.
18.1	PLANNING & MONITORING
18.1.1	The bidder shall prepare detail construction schedule (L-3) as per completion dates given in this document. This schedule must include all milestone and key activities for each sub-system / components in the areas of engineering (wherever applicable), procurement, manufacture (wherever applicable), cogniz, 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.
18.1.2	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.
18.1.3	The bidder will have to Supply & install of 1 No. PC (multimedia PC work station Pentium- Core-i5-650, 3.2 GHZ or above, 1 TB HDD, 8 GB RAM, 100 /1000 MBPS LAN card) of HP / HCL / COMPAQ / LENEVO or equivalent make with window 10 or higher, 64 bit (with roll back to 32 bit O/S and required software like MS Office 2016 or higher, AutoCAD 2014 or higher, ADOBE PDF CREATOR with 1 no. Multifunction (scanner / copy / print) & 1 No. A4 Colour laser printer as per instruction of BHEL for exclusive use of BHEL. These computers / printer / Multifunction shall remain Vendors property and they will be allowed to take out the same after closing of contract. The contractor shall

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	<p>provide data / information etc. in prescribed formats for periodical updating of the progress reports, material management reports, updating of network pertaining to the contractor's scope of work etc. The contractor shall also provide 1 (One) Number computer operators and 1 (One) number service staff for miscellaneous service for BHEL's use at site / Kolkata for reconciliation, progress review & day-to-day planning purpose, documentation etc.</p> <p>These facilities are to be provided within 30 days from start of work date till completion of scheduled contract period.</p> <p>If BHEL do not availed the service of computer / printer / personnel as per requirement, BHEL shall have the right to deduct the amount as per following rates on prorata basis, from contractor's RA bill or any other dues.</p>
18.1.3.1	@ Rs 20,000/- (Twenty thousand)/ month for each computer operator. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.
18.1.3.2	@ Rs 15,000/- (Fifteen thousand) / month for each service staff. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.
18.1.3.3	@ Rs 15,000/- (Fifteen thousand)/ month for each set of computer & printer. Or at actuals (rate +30%) if BHEL arranges this facility, whichever is lower.
18.1.3.4	In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder and if the services services of computer operator(Skilled) & Service staff(unskilled) are being used by BHEL then successful bidder shall be reimbursed by minimum wages with statutory benefits +15% minimum.
18.1.3.5	The contractor's site office must have facilities of communications like E-mail, and telephone / mobile phones within a month from within 30 days from start.
18.2	PROGRESS REPORTING
18.2.1	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.
18.2.2	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.
18.2.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.
18.2.4	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.
18.2.5	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.
18.2.6	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.
18.2.7	Successful bidder has to provide for electronic/ computerized storing and re-production/ printing/ plotting of various data, log sheets, protocols, measurements etc. These may be stored in CD (as per requirement) and handed over to BHEL as per requirement.
18.3	SITE ORGANIZATION
18.3.1	<p>The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL:</p> <ol style="list-style-type: none"> 1. Overall planning, monitoring & control. 2. Quality control and quality assurance 3. Materials management. 4. Safety, fire & security. 5. Industrial relations and fulfilment of labour laws and other statutory obligations.

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18.3.2	The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all times for smooth execution of the contract. This organization shall be reinforced from time to time, as required to make up for slippage from the schedule without any commercial implication to BHEL. The site organization shall be headed by a competent construction manager having sufficient authority to take decisions at site.
18.3.3	On award of contract, the contractor shall submit to BHEL site organization chart indicating the various levels of experts to be deployed on the job. 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 deviations in this regard will not generally be permitted.
18.3.4	The contractor should also submit to BHEL for approval a list of construction equipment, erection tools, tackle etc prior to commencement of site activities. These tools & tackles shall not be removed from site without written permission of BHEL.
18.3.5	The organization chart for site should indicate the various levels of experts to be posted for supervision in the various fields in erection, commissioning etc as applicable. For proper supervision of the work, the contractor shall ensure providing one qualified supervisor against deployment of 15 workmen.
18.4	CONSTRUCTION MANAGEMENT
18.4.1	Based on the approved program, the contractor shall submit a program of construction/ erection/ commissioning for the implementation. These programs would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detail monitoring. The three monthly rolling program with the first month's program being tentative based on the site condition would be prepared based on these programs. The contractor shall also be involved along with NTPC / BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets.
18.4.2	The program would be jointly finalized by the site in-charge of the contractor with BHEL/ NTPC's project coordinator as well as the site-planning representative. The erection program will also identify sequential events matching financial turnover.
18.4.3	The contractor is liable to furnish all documentary evidences towards payment of Works Contract Tax as and when required by BHEL.
18.5	ERECTION SCHEDULE
18.5.1	Contractor shall submit within 15 days of LOI date, detailed program (L2 schedule) of construction / erection / commissioning along with matching resources T&P deployment and manpower deployment schedule for approval to Site In-Charge/Project Manager-Kolkata. L2 schedule shall be the working level document demonstrating contractor's ability and methods of completing the work within the key milestones identified in the tender specification These program would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detailed monitoring. The three monthly rolling program with the first month's program being tentative based on the site conditions would be prepared based on these program. The Contractor shall also be involved along with the Customer/BHEL to tie up detailed resource mobilisation plan over the period of time of the contract matching with the performance targets.
18.5.2	The program would be jointly finalised by the site in-charge of the contractor with BHEL /Customer's project coordinator as well as the site planning representative. The erection program will also identify the sequential erectable tonnages
18.5.3	Contractor shall submit daily work program based on above schedule. Deferment of above schedule is not acceptable. Contractor will adhere to schedule & augment resources to ensure completion as per schedule.
18.6	Detailed description of major equipment (per unit & common) to be Installed, tested and commissioned under this specification is given below: Below mentioned details are to give only general idea of FGD system/ equipment's to the bidder. Any equipment's/system's not mentioned in this specification but which are required for the completion and smooth running of the FGD system contractor shall do the erection and commissioning of that system within the finally accepted rates / prices.
18.6.1	Absorber System:
18.6.1.1	An independent Limestone Forced Oxidation (LSFO) type absorber system shall be provided for each unit. Each absorber system shall be complete with:
18.6.1.2	Absorber tower complete with re-circulating slurry spray header(s) and nozzles, three stage mist eliminators, wash water nozzles, oxidation tank integral to tower, oxidation headers and nozzles, and agitators and all internal systems integral to the working of the absorber.

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18.6.1.3	2x100% re-circulating slurry pump for each level of spray.
18.6.1.4	Complete Ducting System from ID fan common outlet duct to absorber tower & from absorber outlet to wet stack chimney.
18.6.1.5	2x100% Centrifugal/ positive displacement type oxidation blowers / compressors
18.6.1.6	1 No. Emergency water tank for spraying water at inlet of Absorber for upset condition.
18.6.1.7	2x100% gypsum bleed pumps.
18.6.1.8	Auxiliary Absorbent tank
18.6.1.9	Piping from Gypsum bleed pumps to gypsum dewatering system, along with recirculation line, necessary isolation and control valves.
18.6.1.10	Routing of the ducting/piping system complete with supports, structures, trestles, absorber platforms
18.6.1.11	Passenger cum Goods elevator for each Absorber of minimum capacity of 1000 kgs.
18.6.2	LIMESTONE GRINDING AND SLURRY PREPARATION SYSTEM(COMMON)
18.6.2.1	Limestone grinding system for all the units and shall comprise of:
18.6.2.2	2X100% Limestone storage silos each having minimum 24 hours storage capacity equivalent to the requirements of all the units. The storage silo shall be complete with supporting steel structure, platforms, staircase, air canons, power operated gates, gravimetric feeders
18.6.2.3	2x100% wet horizontal ball mills with each mill.
18.6.2.4	Two limestone slurry tanks, complete with all accessories and Agitator(s).
18.6.2.5	2x100% Limestone slurry pumps for each absorber connected to each of the limestone slurry tank. Each pump catering to slurry requirement of each unit's absorber.
18.6.2.6	Limestone slurry piping to each absorber, along with recirculation lines, all isolation and control valves.
18.6.2.6	Each mill shall be fed from an independent Limestone bunker. Each mill shall be complete with the following items, as a minimum requirement:
a	Bunker outlet gate
b	Gravimetric limestone feeder along with its drive and all other auxiliaries
c	Separator tank with agitator(s).
d	2x100% Mill circuit pumps.
e	One set of hydro-cyclone
f	Peripheral/central drive system with motor, speed reducer gearbox and other auxiliaries.
g	Auxiliary motor for inching operation with speed reducer.
h	Complete lubricating system
i	Lube oil pumps, coolers, duplex oil filters, connecting piping
	All connecting pipes/chutes along with necessary valves between various systems of the mills
j	Limestone grinding System
18.6.3	GYPSUM DEWATERING SYSTEM(COMMON)
	Each set of dewatering equipment (01 working set + 01 standby set) shall comprise of the following items as a minimum requirement:
18.6.3.1	One set of primary hydro-cyclones
18.6.3.2	One vacuum belt filter
18.6.3.3	Vacuum receiver
18.6.3.4	Vacuum pump
18.6.3.5	One set of secondary hydro-cyclones
18.6.3.6	Filtrate tank along with filtrate water pump
18.6.3.7	Cake washing Pumps for Vacuum Belt Filter.
18.6.3.8	Cloth washing Pumps for Vacuum Belt Filter.
18.6.3.9	Waste water tank along with agitator and centrifugal pumps
18.6.3.10	Lime neutralization tanks
18.6.4	PROCESS WATER STORAGE TANKS AND PUMPS
18.6.4.1	Two Process water Storage tanks along with Two numbers Booster water pumps, if required,
18.6.4.2	2x100% Process Water Pumps for each unit connected to each of the Process water Storage tanks along with all necessary piping, valves.
18.6.4.3	2x100% Mist Eliminator Wash Water Pump for each unit connected to each of the Process water Storage tanks along with all necessary piping, valves.

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18.6.4.4	One clarified water Storage tanks (each tank catering to the clarified water requirement for one vacuum Belt Filter) along with three numbers of clarified Booster water pumps, if required, from terminal point.
18.6.4.5	2X100 % cake Washing Pumps for each Vacuum Belt Filter.
18.6.4.6	2X100 % cloth Washing Pumps for each Vacuum Belt Filter.
18.6.4.7	Any other pump or storage system not specified but required to meet the system requirement shall be provided by the contractor with the approval of Employer.
18.6.4.8	All drains and overflow lines from the tanks shall be terminated to the nearest trench/drain.
18.6.4.9	Emergency water storage tanks
18.7	Booster Fan & Isolation Gates
18.7.1	For each unit, two (2) nos. Booster Fans of axial type, Constant speed, variable pitch controlled each with drive motor, base plates, foundation bolts and nuts, inletbox, discharge case, coupling, coupling guard and suitable arrangement to prevent rain water entry to fan motor.
18.7.2	Each Booster Fan shall be provided with bearing lubrication and hydraulic blade pitch control unit(s) consisting of;
a	2x100% Oil pumps each with motor, coupling and coupling guard.
b	2x100% Oil coolers.
c	2x100% Filters, differential pressure switches, etc.
d	One (1) Oil storage tank
18.7.3	Motorized Guillotine type gates with 2x100% seal air fans shall also be provided at suction & discharge of each Booster Fan.
18.7.4	Inter connected piping, valves and fittings .Electrical actuator with accessories
18.8	PIPING
18.8.1	Slurry Piping
18.8.1.1	Piping from gypsum bleed pumps to gypsum dewatering system, along with recirculation lines (if required) necessary isolation and control valves
18.8.1.2	Limestone slurry piping to each absorber, along with recirculation lines, all isolation and control valves.
18.8.1.3	All connecting pipes / chutes along with necessary valves between various systems of the mill and from hydro-cyclone to common slurry storage.
18.8.1.4	All slurry pipes having Material of construction carbon steel and rubber lined. End connections are bolted flanged connections.
18.8.2	Oxidation Air piping
18.8.3	Service Water
18.8.4	Service Air & Instrument Air
18.8.5	Process water piping
18.8.6	Equipment Cooling water system piping
18.8.7	Piping and equipment, as per requirement / drawings are to be thermally. Insulated with bonded / unbounded mineral wool /LRB mineral wool and to be covered with aluminum cladding
18.8.8	All the above systems of piping include the erection of pipes, bends, elbows, valves, fittings, impulse piping and including root valves, sampling lines, drains, hangers and supports & other accessories so as to make the systems complete in all respect.
18.9	Fire Protection system (Common)
18.9.1	Hydrant System
18.9.1.1	Hydrant system consists of (pipe, hydrant valves, landing valves, water monitors, hoses, branch pipes and nozzles etc)
18.9.2	HVW & MVW Spray System(High Velocity and Medium Velocity)
18.9.2.1	It shall consist of water mains network, deluge valves, isolation valves, Y type strainers, spray nozzles/ projectors, spray nozzles piping network.
18.9.3	Fire Extinguishers
18.9.3.1	The contractor shall install the following fire extinguishers at various locations of FGD system as per TAC requirement.
18.9.3.2	Pressurized water type (9lit. capacity as per IS 15683)
18.9.3.3	CO2 type (4.5 kg Cap IS:15683)
18.9.3.4	Dry chemical type (6 kg Cap IS:15683)

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18.9.4	Necessary civil works for the fire protection system includes (trenches/ pedestals/ foundations /sheds/sandfilling) excluded from the scope of this contract and shall be done by the civil agency of the BHEL. Fire detection package and associated C&I/cabling work is excluded from scope of this contract and shall be done by another agency. However the wrapping and protective coating of the buried piping shall be in the scope of contractor.
18.9.5	The complete Fire Detection and Protection Systems shall be as per the guidelines/ codes/standards / rules of TAC/ NFPA / IS: 3034 / OISD etc. and all the systems, equipment's and installation shall be got approved from TAC accredited professional(s)-India. Customer (M/s BRBCL) will make arrangement of TAC approved agency for accreditation of work. The contractor has to facilitate TAC for getting approval. However, contractor is responsible for availing the TAC approval for Fire protection system in total (for fire detection another agency of BHEL will be responsible). Contractor also responsible for getting any necessary approval from regulatory and statutory body of TAC if any needed. Obtaining the all reports from concerned statutory departments is the responsibility of the contractor. All these activities should be carried within the quoted rates.
18.10	Equipment Cooling Water System (Common)
18.10.1	Equipment Cooling water system for all Four units with a closed circuit cooling system for cooling of the various auxiliaries of FGD system. The equipment cooling system shall include the following:
18.10.2	2x100% Self cleaning strainers on the secondary side.
18.10.3	5 x 25% (4 working + 1 standby) capacity of plate type heat exchangers.
18.10.4	6 x 25% (4 Working + 2 standby) capacity FGD Auxiliary (Secondary) Cooling water pumps, along with drives.
18.10.5	5 x 25% (4 Working + 1 standby) capacity FGD DM (Primary) cooling water pumps along with drives.
18.10.6	One Overhead DM water tank (ECW O/H tank).
18.10.7	Alkali (Sodium Hydroxide) preparation tank, agitator and motor, piping, valves etc
18.11	The equipment /piping systems indicated above are only major items and does not cover all the equipment / piping system to be erected / commissioned. Contractors are however, required to erect / commission within the price quoted by them, all connected equipment / system shown in manufacturer"s drawings / other documents which may be necessary for erection completion and overall commissioning of FGD system.
18.12	The contractor undertakes to erect/ commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same.
18.13	The scope of work also includes Erection, fit-up/alignment, welding/bolting, NDT of Structure Steel works for the following buildings / structures of Flue Gas Desulphurization (FGD) Systems <ul style="list-style-type: none"> a) FGD CONTROL ROOM BUILDING (FGDCR) b) COMPRESSOR HOUSE c) ACW BUILDING d) BALL MILL BUILDING [BMB] (LIME STONE GRINDING HOUSE) e) GYPSUM DEWATERING BUILDING [GDWB] f) STRUCTURAL PLATFORM FOR CHIMNEY (2 NOS OF 150 M HEIGHT) g) LIMESTONE CRUSHER HOUSE h) TRANSFER HOUSES i) OVERGROUND LIMESTONE CONVEYER, GALLERIES AND TRESTLES j) OVERGROUND GYPSUM CONVEYER, GALLERIES AND TRESTLES k) CLOSED GYPSUM STOCK PILE SHED WITH TRAVELLING TRIPPER l) LIMESTONE STORAGE SILOS m) 2.10.13 CABLE GALLERIES AND TRESTLES. n) MISCELLANEOUS STRUCTURES TO COMPLETE FGD SYSTEM
18.14	Diesel Generator Set: DG sets (1 no) with integral piping, galvanized pre-fabricated exhaust support structure, exhaust piping and enclosure.
18.15	Weight schedule /BOQ of the FGD system Annexure-II of this document
18.16	Important information for the Erection Work of FGD system under this tender specifications:

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18.16.1	Absorber tower have top elevation of approx. 47 mtr with 7 tier structure and average casing panels have size (6 mx4m x0.5 m).	
18.16.2	Absorber System W/D (wet dry) interface having lining of C276 material. Site welding of liner is in the contractor scope. The liner with plug welding and special electrode for the welding of liner shall be supplied by BHEL Ranipet. Welding to be done as per approved procedure of BHEL/NTPC.	
18.16.3	Tanks shall be supplied by the units in more than one segment (rolled sections) having height of each segment approx. 2500 mm. Contractor have to complete the assembly at site with necessary welding/NDT/testing as per the approved FQP. Rubber lining of the tanks (along with surface preparation by blasting or anyother approved method and necessary testing i.e spark test/ pin hole test ofthe rubber lining) excluded from the scope of work and shall be done byrubber lining vendor of BHEL Ranipet. However necessary assistance to be provided by the contractor.	
18.16.4	Lime stone silos shall be supplied by the units in more than one segment and height of each segment shall be 2500 mm. Contractor shall have tocomplete the assembly, final welding, /NDT/testing as per the approved drawings/documents/ FQP.	
18.16.5	Erection and commissioning of the below mentioned equipment's/system underFGD system excluded from the scope of work under this contract. Erection andcommissioning shall done by the BHEL Ranipet vendor /system supplier/OEM of the system.	
a	Absorber Elevator	
b	Rubber lining of tanks and absorber	
c	Glass flake lining of ducts (absorber outlet to wet stack chimney portion)	
18.16.6	However, contractor scope limited to extend the necessary assistance along withT&Ps, scaffolding to the vendor during the erection and commissioning of the above system.	
18.6.7	BHEL shall provide the technical support for commissioning of below mentioned equipment's on need basis. If support required during the erection same shall be provided free of charges by BHEL.	
	<ul style="list-style-type: none"> a) Slurry Recirculation Pump System b) Mist Eliminator & Accessories c) Air Oxidation System d) Slurry Pumps & Accessories e) Agitators f) Limestone Mill g) Primary Hydroclone and Accessories h) Secondary Hydroclone and Accessories i) Gypsum Belt Filter And Accessories 	
18.16	Quantities and dimensions mentioned above for tanks, silos, absorber are indicative and to give general idea regarding the extent of work for estimation purpose. Quantity and dimension detail based on the engineering /drawings /documents available as on date of NIT and liable for variation.	
18.17	TERMINAL POINTS	
18.17.1	Flue Gas Duct	One tapping from the common Flue Gas Duct going towards the existing Chimney
18.17.2	Equipment Cooling Water Normal make up to ECW tank	Contractor shall take a tap off suitably from the existing DM normal make up header (DM normal make up pump discharge) available along C-row at CD bay rack for meeting the makeup water requirement of ECW system.
18.17.3	Emergency make up to ECW tank	Contractor shall take a tap off suitably from the existing DM Emergency make up header (condensate transfer pump discharge) available along C-row at CD bay rack for meeting the emergency make up water requirement of ECW system.
18.17.4	Process Water	For FGD system, Contractor shall take a tap off suitably from the existing CW blowdown header available near the CW pump house.
18.17.5	Gypsum Wash Water (Clarified Water)	For Gypsum washing, Contractor shall take a tap off suitably from the existing HVAC header

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		(HVAC make up pump discharge) available along C-row at CD bay rack for meeting the water requirement of Gypsum washing.
18.17.6	Potable water	Contractor shall take a tap off suitably from the existing potable water supply header (potable water pump discharge) available along C-row at CD bay rack for meeting the potable water requirement.
18.17.7	Waste Water	Neutralized waste water pipes shall be taken up to the Ash mound located near the plant
18.17.8	Fire detection and Protection system	Separate hydrant and spray header (within 100m) available in plant area for tapping required for hydrant and spray system of FGD.
18.17.9	All interconnections of matching flanges/expansion joints/piping/ducting etc, at terminal points specified above shall, however, be in the scope of Contractor.	
19.0	TOOLS & PLANTS (TO BE PROVIDED BY CONTRACTOR)	
19.1	Tentative list of T&P to be deployed by contractor for successful completion of work is mentioned in relevant Annexure-A .	
19.2	The above list is only indicative and these T&Ps may not be required for entire contract period but contractor shall ensure the availability of the T&Ps as per work requirement and T&P Deployment schedule. T&P Deployment schedule shall be finalized at site in consultation with BHEL Engineer based on the work fronts/work requirement. BHEL decision shall be final and binding regarding the T&P deployment schedule. Contractor shall mobilize / maintain the T&P's as per the deployment schedule notified time to time by BHEL Engineer.	
19.3	As per requirement - Contractor has to deploy T&P, MMD, IMTE as per requirement of site and as decided by BHEL Engineer.	
19.4	If any one of T&P mentioned above is not needed for proper execution of scope of work, provided contractor has not utilized BHEL free issued T&P for completing such work, no recovery from contractor shall be applicable.	
19.5	Any additional item required in addition to above mentioned T&P for proper execution of scope of work, contractor has to arrange such T&P within quoted rate on the instruction of BHEL in writing in a reasonable period within two weeks from the written instruction from BHEL.	
19.6	In the event of contractor failing to arrange the required tools, plants, machineries, equipment, material or non-availability of the same owing to breakdown, BHEL will make alternative arrangement at the risk and cost of the contractor.	
19.6.1	Case 1: BHEL provides its own Capital T&P. In case the BHEL provides any T&P which is owned by BHEL, hire charges (as per BHEL norms) will be recovered from the contractor as per the prevailing BHEL corporate hire charges. In case, the T&P is specifically listed in "T&Ps to be deployed by Contractor", "Hire charges applicable to outside agencies other than contractors working for BHEL" will apply. If not listed, "hire charges applicable to contractor working for BHEL" will apply. The hire charges of Capital tools & plants are exclusive of operating expenses e.g. operator, fuel & consumables and the same shall be arranged by the contractor at his cost.	
19.6.2	Case 2 In all cases other than that specified in case 1 above, actual expenses incurred by BHEL along with applicable overheads will be back-charges to the contractor	
19.7	In the event of need of change of type of any of major T&Ps, approval shall be taken from BHEL Engineer in-charge prior to mobilization. The decision of Number of T&P required due to replacing the enlisted T&P as per above table, shall be taken after analyzing the production capacity and suitability of both the T&Ps.	
19.8	All the tools and tackles/measuring instruments shall be duly tested/calibrated and valid certificate to that effect should be submitted to BHEL site in-charge before the start of work.	
19.9	If the work related to T&Ps mentioned above is completed then, BHEL can release that T & P during contract period / extended period if any. However, written permission shall be taken by contractor from BHEL construction Manager for releasing the T&P.	
20.0	TOOLS & PLANTS (TO BE PROVIDED BY BHEL ON SHARING BASIS)	

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20.1	List of T&P to be provided by BHEL on sharing basis for successful completion of work is mentioned in relevant Annexure-B .	
20.2	Contractor shall transport from BHEL stores, install, operate, carry out maintenance, dismantle after use and return to BHEL stores T&Ps mentioned above for his use.	
21.0	INSURANCE	
21.1	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.	
21.2	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.	
21.3	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.	
21.4	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.	
21.5	Other conditions of Insurance shall be as per relevant clause of GCC/SCC.	
22.0	TIME SCHEDULE	
22.1	The contractor is required to commence the work within 15 days from the date of intimation by BHEL. However, the actual date of start of work, to fix up the zero date of the contract, will be certified by BHEL Engineer after adequate mobilization of manpower and T&Ps by the contractor.	
22.2	Entire work shall be carried out in accordance with the broad schedule for FGD system as furnished below, within the stipulated completion period. This schedule will undergo review and based on progress vis-à-vis project requirement, contractor shall submit revised schedule for approval of BHEL/Customer M/s NTPC.	
22.3	Schedule for major construction activities covered under the scope of work is as below for FGD Unit #1:	
	Major activity/Milestone description	Schedule Wef start of work (SOW)
22.3.1	Start of FGD Erection Work	Within 01 month
22.3.2	Air tightness test of complete ducting-(M1)	09 months
22.3.3	Completion of Erection work of FGD system	10 months
22.3.4	Commissioning of FGD#1 -(M2)	12 months
22.3.5	Completion of Facilities FGD#1	13 months
22.4	Unit # 2 milestones will have a phase lag of 3 (three) months with Unit# 1.	
22.5	Unit # 3 milestones will have a phase lag of 3 (three) months with Unit# 2.	
22.6	Unit # 4 milestones will have a phase lag of 3 (three) months with Unit# 3.	
22.7	The contractor shall plan his work in such a manner so as to meet the overall project schedule, in consultation with BHEL/ customer engineer.	
22.8	Contractor shall submit daily work program based on above construction schedule.	
23.0	COMPLETION PERIOD	
23.1	The entire work under this scope shall be successfully completed in all respect within 22 (Twenty-Two) months from the date of start of work as certified by Construction Manager, BHEL.	
23.2	Contractor shall mobilise resources to start the work within 15 days from date of intimation of BHEL.	
23.3	However, actual date of start of work shall be reckoned based on certification of Construction manager,	
24.0	LIQUIDATED DAMAGE/ PENALTY	

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24.1	Penalty for Intermediate Milestones
24.1.1	M1 and M2 shall be intermediate Milestones for this work. Refer Clause No. 22.3 above for M-1 & M-2.
24.1.2	In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.
24.1.3	Incase delay in achieving M1 milestone is solely attributable to the contractor, 0.5% per week of executable contract value* limited to Maximum 2% of executable contract value will be withheld.
24.1.4	Incase delay in achieving M2 milestone is solely attributable to the contractor, 0.5% per week of executable contract value* limited to maximum 3% of executable contract value will be withheld.
24.1.5	Amount already withheld, if any, against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 milestone.
24.1.6	Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
24.1.7	Final deduction towards LD (if applicable), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of intermediate milestones shall be adjusted against LD or released as the case may be.
24.1.8	In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted in to recovery.
	Note: *Executable contract value-value of work for which inputs/fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.
24.2	LIQUIDATED DAMAGE/ PENALTY FOR OVERALL DELAY
24.2.1	If the contractor fails to maintain the required progress of work which results in delay in the completion of the work as per the contractual completion period, BHEL shall have the right to impose Liquidated Damage/Penalty at the rate of 0.5% of the contract value, per week of delay or part thereof subject to a maximum of 10% of the contract value. For this purpose, the period of delay shall be the delay attributable to the Contractor for the completion of work as per contract. Contract Value for this purpose, shall be the final executed value exclusive of ORC, Extra Works executed on Manday rate basis, Supplementary/Additional Items and PVC.
24.3	In case of LD recovery, the applicable GST shall also be recovered from the contractor.
25.0	CERTIFICATE TOWARDS COMPLETION
	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.
26.0	GUARANTEE
26.1	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.
26.2	The contractor shall guarantee the work executed under the scope of the contract for a period of 12 (twelve) months from the date of start of guarantee period as certified by the engineer (ie on completion of total work under scope and taking over by BHEL) and 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.
27.0	INTEST BEARING RECOVERABLE ADVANCE(IBRA)
	IBRA /Mobilisation advance not applicable for this tender.
28.0	OVER RUN CHARGES
	Applicable as per GCC.
29.0	REVISION ON ACCEPTED CONTRACT RATE
	Not applicable in this tender.
30.0	PRICE VARIATION CLAUSE
	Applicable as per GCC.
31.0	EXTRA/ ADDITIONAL ITEMS OF WORK
	It shall be as per GCC.
32.0	SECURITY DEPOSIT, PERFORMANCE BOND & FINAL BILL

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32.1	Security deposit shall be applicable as per relevant clause of GCC (Volume-IB).
32.2	Performance bond is not applicable for the tender.
32.3	List of documents to be submitted & jointly protocoled indicating acceptance of final bill by BHEL.
32.3.2.1	Final bill.
32.3.2.2	Measurement for final bill signed, jointly signed by BHEL & contractor's representative.
32.3.2.3	Statement having cumulative joint measurement for the contract, jointly signed by BHEL & contractor's representative.
32.3.2.4	Claim by contractor for refund of security deposit.
32.3.2.5	Jointly signed material reconciliation statement.
32.3.2.6	Statement of payment received from BHEL – Bill wise (Including RA/ PVC/ ORC/ rate revision/ extra work).
32.3.2.7	No claim certificate by contractor.
32.3.2.8	Clearance certificates wherever applicable, viz clearance certificates from customer, various statutory authorities, like Labour Department, PF Authorities, Commercial Department, etc.
32.3.2.9	Notarized Indemnity Bond as per prescribed format.
33.0	TAXES, DUTIES ETC
33.1	All taxes excluding GST & BOCW Cess (as specified elsewhere in the tender) but including, Charges, Royalties, any State or Central Levy and other taxes for materials if any obtained for the work and for execution of the contract shall be borne by successful bidder and shall not be payable extra by BHEL. Any increase of above at any stage during execution of contract, including extension of the contract, shall have to be borne by successful bidder contractor. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.
33.2	GST along with Cess (as applicable) legally leviable & payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST along with Cess (as applicable) in their quoted rates/ price.
33.3	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.
33.4	Since GST on output will be paid by BHEL separately as enumerated above, bidder's your quoted rates / price should be after considering the Input Credit under GST law at bidder's end.
33.5	TDS under Income Tax Act shall be deducted as per prevailing IT rules from the bills.
33.6	TDS under GST shall be deducted as per prevailing GST rules from the bills.
33.7.1	You may collect TCS under section 206C(1H) of Income Tax Act, 1961 if applicable.
33.7.2	In case, you collect TCS under section 206C(1H) of Income Tax Act, 1961, following compliance is required.
33.7.2.1	TAN and PAN of vendor should appear in all invoices/claims. Copy of TAN /TCS registration is to be submitted.
33.7.2.2	Amount of TCS and Assessable value on which TCS has been calculated should be specified clearly in the invoice.
33.7.2.3	You shall be required to submit certificate of TCS in Form no. 27D within 15 days from the due date for furnishing the statement of tax collected at the source.
33.7.3	In case, you do not collect TCS under section 206C(1H) of Income Tax Act, 1961, following declaration is to be submitted alongwith each invoice: - "I/We hereby declare that I/We are not required to collect TCS under section 206C(1H) of Income Tax Act, 1961, on this bill.
33.7.4	In event of failure to comply with the provisions of the Act, or proper certificate not issued, or if tax collected but not remitted to the Government, or for any other reason and thereby causing loss to BHEL, the same shall be recoverable from the vendor with applicable interest.
33.7.5	You shall comply with all statutory amendment/notifications in this respect.
33.8	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.
33.9	Successful bidder to intimate immediately on the day of removal of goods (in case of any supply of goods) to

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	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.
33.10	In case of delay in submission of above mentioned documents on the date of despatch, BHEL may incur penalty/ interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from successful bidder, in case such delay is not attributable to BHEL.
33.11	In case of raising any Supplementary Tax Invoice (Debit / Credit Note), successful bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
33.12	Successful bidder shall comply with the Time Limit prescribed under the GST Law and rules thereof for raising of the Tax Invoice. If any supply of goods is applicable, successful bidder shall also ensure prompt delivery of goods after despatch.
33.13	Bidder shall note that in case GST credit is delayed / denied to BHEL due to delayed / non receipt of goods and / or Tax Invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons, not attributable to BHEL, GST amount shall be recoverable from successful bidder along with interest levied/ leviable on BHEL, as the case may be.
33.14	Successful bidder shall upload the invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act, and the same shall be available to BHEL in FORM GSTR-2A/2B electronically through the common portal. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the successful bidder along with interest levied / leviable on BHEL.
33.15	Way Bill: Successful bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract. Successful bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit / Way Bill, if required, shall be arranged by successful bidder and BHEL will not supply any Road Permit/ Way Bill for this purpose.
33.16	Any new taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extension, if the same is not attributable to you), shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
33.17	Benefits and / or abolition of all existing taxes must be passed on to BHEL against new taxes, if any, proposed to be introduced at a later date.
34.0	TERMS OF PAYMENTS
34.1	RETENTION AMOUNT
34.1.1	Retention Amount shall be 5% of executed contract value and shall be recovered at the rate of 5% from each Running Bill admitted, including PVC Bills.Refer GCC clause no 2.22.1.
34.1.2	Retention Amount shall be refunded as per clause no 2.22.2 of GCC.
34.2	INTERIM PAYMENTS
34.2.1	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 as per the Billing schedule (Annexure-XII). 5% of gross value of each RA bill shall be retained from each RA bill as 'rentention Amount' as described in clause no 34.1 above. All admissible recovery / adjustments etc. shall be made from the interim payable amount.
34.2.2	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.
34.2.2.1	0.7 % shall be paid on compliance of house keeping of vendor's working area and store/ office areas.
34.2.2.2	0.3 % shall be paid on compliance of general illumination of vendor's working area and stores, office area.
34.2.2.3	0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.
34.2.2.4	0.3 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.

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34.3	BHEL site at its discretion may further split up the above percentages of break up and effect payment to suit the site condition, cash flow requirement, according to the progress of work.
34.4	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.
34.5	Applicable GST, which can be claimed at any point, shall be released to you upon compliance of following:
34.5.1	You declaring such Invoice in your GSTR-1
34.5.2	Receipt of Goods / services and Tax Invoice by BHEL
34.5.3	Confirmation of payment of GST thereon by you on GSTN Portal
34.6	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.
35.0	CONTRACT PRICE
35.1	The bidder shall quote their price/rates strictly in accordance with prescribed price/rate schedule - Volume-III (SCH-1).
35.2	The quantities of the various items mentioned in the respective Price schedules, Volume-III are approximate, based on very preliminary information and may vary to any extent or to 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 this contract including extra items, if any, but excluding any price variation, remains within - 15 % of the awarded price (as per LOI / WO).
36.0	IMPOSITION OF INTEREST ON DELAYED RECOVERY, IF ANY
36.1	Reconciliation of measurement shall be carried out at site on quarterly basis.
36.2	Above quarterly reconciled figures shall have Tolerance in accuracy as '+1.0% of the total value of actual work executed in that quarter' 'Value of actual Work' for this purpose shall be inclusive of PVC and ORC.
36.2.1	For prepayment beyond tolerance limit, if any, recovery/adjustment shall be made from next payable.
36.3	Final reconciliation is to be done on yearly basis. For prepayment, if any, Recovery/adjustment need to be made from the vendor from their next payable.
36.4	In case, contractor requests to postpone any recovery, Interest on such delayed Recovery will be applicable @ SBI Base Rate plus 6% till the period of recovery. Suitable intimation to vendor is to be made in this regard.
37.0	OTHER TERMS
37.1	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.
37.2	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				
TENTATIVE LIST OF T&Ps and MMEs TO BE PROVIDED BY THE CONTRACTOR				
Contractors may please note that this list is not exhaustive & given for guidance purpose. The contractor may be required to deploy additional T&Ps not mentioned in this list at their own cost for proper execution of the job.				
SN	DESCRIPTION OF EQUIPMENTS	CAPACITY (MINIMUM)	MINIMUM QUANTITY	REMARKS
1	Crawler Crane	150 MT	01 No	This crane should be made available at site from the start of work and to be deployed till erection completion of Absorber of Unit#1,2,3 & 4 and Crusher house.
2	Crawler Crane	100 MT	01 No	Crane to be made available at site from the start of work till completion of erection work of Unit#1,2,3 & 4 for which said crane is required.
3	Tyre mounted / mobile crane (Telescopic boom, Hydraulically operated with turret function)	40 MT	01 No	As required
4	Tyre mounted / mobile crane (Telescopic boom, Hydraulically operated with turret function)	40 MT	01 No	As required
5	Pick & carry type tyre mounted mobile crane. (Farana only)	12/14/18 MT	04 Nos	To be deployed as per instruction of BHEL Engineer.
6	Trailer with prime mover	20 MT	03 Nos	As required
7	Trailer with prime mover	40 MT	As required	As required
8	TRACTOR TRAILER	15/20MT	As required	To be deployed as per instruction of BHEL Engineer.
9	TRUCK	Adequate capacity	As required	To be deployed as per instruction of BHEL Engineer.
10	SLINGS, 'D'-SHACKLES, MAX PULLER.	01 MT TO 10MT	As required	To be deployed as per instruction of BHEL Engineer.
11	SLINGS, 'D'-SHACKLES, MAX PULLER.	01 MT TO 10MT	As required	To be deployed as per instruction of BHEL Engineer.
12	SLINGS, 'D'-SHACKLES, MAX PULLER, PULLEY BLOCKS, HYDRAULIC JACKS, ETC ABOVE 10 MT.	As required	As required	To be deployed as per instruction of BHEL Engineer.
13	SPANNER SETS RING/D.	UP TO 56 MM	As required	To be deployed as per instruction of BHEL Engineer.
14	Tube expander	As required	01 Nos	To be deployed as per instruction of BHEL Engineer.

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15	Air compressor (electric/diesel operated)	210 CFM, 7 KG/CM2	02 Nos	To be deployed as per instruction of BHEL Engineer.
16	TIG welding set	As required	As required	To be deployed as per instruction of BHEL Engineer.
17	Submerged ARC WELDING M/C		As required	To be deployed as per instruction of BHEL Engineer.
18	Oxy Acetelyne Gas cutting Machine		As required	To be deployed as per instruction of BHEL Engineer.
19	DC arc welding machine		As required	To be deployed as per instruction of BHEL Engineer.
20	Electric operated Bolt tightening machines		As required	To be deployed as per instruction of BHEL Engineer.
21	3-phase distribution board with complete set up for drawl of construction power	As required	As required	To be deployed as per instruction of BHEL Engineer.
22	Power cable for drawl of construction power	As required	As required	To be deployed as per instruction of BHEL Engineer.
23	Radiography arrangement with radioactive isotope source	Iridium-192	As required	To be deployed as per instruction of BHEL Engineer.
24	Radiography arrangement with radioactive isotope source	Cobalt-60	As required	To be deployed as per instruction of BHEL Engineer.
25	Theodolite of required accuracy	To ensure verticality of structural columns.	As required	To be deployed as per instruction of BHEL Engineer.
26	Self-drilling cum tapping machine for screws of roof sheets	As required	As required	To be deployed as per instruction of BHEL Engineer.
27	Electro-hydraulic pipe bending machine	Up to 2" nb and 12 mm thick pipes	As required	To be deployed as per instruction of BHEL Engineer.
28	Radiography film viewer	As required	As required	To be deployed as per instruction of BHEL Engineer.
29	Hydraulic pipe bending machine (manual	For bending of pipes up to 50 mm nb size	As required	To be deployed as per instruction of BHEL Engineer.
30	Pipe chamfering machine /Tube Cutting	4-14"	As required	To be deployed as per instruction of BHEL Engineer.
31	Pipe chamfering machine /Tube Cutting	4-20"	As required	To be deployed as per instruction of BHEL Engineer.
32	Pipe cutting & beveling machines		Adequate nos.	To be deployed as per instruction of BHEL Engineer.
33	Chain pulley blocks of various & Suitable capacities		As required	To be deployed as per instruction of BHEL Engineer.
34	Baking oven with thermostat and temperature gauge for welding electrodes	As required	As required	To be deployed as per instruction of BHEL Engineer.
35	Holding oven with thermostat and	As required	As required	To be deployed as per instruction of BHEL Engineer.

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	temperature gauge for welding electrodes			
36	Portable oven for welding electrodes	As required	As required	To be deployed as per instruction of BHEL Engineer.
37	Electric winch	2/3/5/10/15 ton capacity	As required	To be deployed as per instruction of BHEL Engineer.
38	Hand winch	0.5 ton capacity	As required	To be deployed as per instruction of BHEL Engineer.
39	Scaffolding materials with clamps.	Suitable for working at various heights	As required	For Alignment, welding & Insulation works. To be deployed as per instruction of BHEL Engineer.
40	Profile making m/c	For aluminium sheet cladding work	As required	To be deployed as per instruction of BHEL Engineer.
41	Nibbling m/c	For refractory and other required activities	As required	To be deployed as per instruction of BHEL Engineer.
42	Shearing m/c	For refractory and other required activities	As required	To be deployed as per instruction of BHEL Engineer.
43	Portable grinding m/c	As required	As required	To be deployed as per instruction of BHEL Engineer.
44	Portable drilling m/c	As required	As required	To be deployed as per instruction of BHEL Engineer.
45	Hoisting and pulley devices/pulleys	As required	As required	To be deployed as per instruction of BHEL Engineer.
46	Fire retardant tarpaulins	As required	As required	To be deployed as per instruction of BHEL Engineer.
47	Fire extinguisher	As required	As required	To be deployed as per instruction of BHEL Engineer.
48	Hydraulic Jacks	10/20/50/100 MT	As required	To be deployed as per instruction of BHEL Engineer.
49	Dewatering pumps		As required	To be deployed as per instruction of BHEL Engineer.
50	Various sizes of clamps/ fixtures for assembling		As required	To be deployed as per instruction of BHEL Engineer.
51	Magnetic particle testing equipment-DRY & WET Type		As required	To be deployed as per instruction of BHEL Engineer.
52	Temperature recorder for 0-1000C 6/12 points with thermo couples / rods and compensating cable		As required	To be deployed as per instruction of BHEL Engineer.
53	Spectrometer for metal testing		As required	To be deployed as per instruction of BHEL Engineer.
54	Alco meter for paint thickness checking		As required	To be deployed as per instruction of BHEL Engineer.
55	Hand Operated Megger 500 / 1000 V		As required	To be deployed as per instruction of BHEL Engineer.
56	Tong Tester 10, 20 Or 50 Amp + / - 3 % Accuracy		As required	To be deployed as per instruction of BHEL Engineer.
57	Digital and Analogue Multimetres		As required	To be deployed as per instruction of BHEL Engineer.

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58	U Tube Manometer 0-2000 mm Water Column		As required	To be deployed as per instruction of BHEL Engineer.
59	Inclined Manometer 0-50 mm Water Column		As required	To be deployed as per instruction of BHEL Engineer.
60	Calibrated Pneumatic Torque wrench		As required	To be deployed as per instruction of BHEL Engineer.
61	Bolt Tension Calibrator		As required	To be deployed as per instruction of BHEL Engineer.
62	Alco meter for paint thickness checking		As required	To be deployed as per instruction of BHEL Engineer.
63	Alco meter for paint thickness checking		As required	To be deployed as per instruction of BHEL Engineer.

MEASURING AND MONITORING DEVICES (MMD)

As per requirement to be finalized at site, shall meet the requirements as per field quality plan and other erection, testing related activities.

NOTE:

1. Considering operational safety, the use of material handling equipment "HYDRA" is banned, agencies has to deploy the Pick & Carry cranes (Farana) of required capacity.
2. Any or part or all of the T&Ps of the contractor identified for the tendered package shall not be engaged for any works other than that of the works intended in this tender.
3. During the extended period of contract, services of T&Ps shall be provided by the contractor as per the instruction of BHEL engineer
4. All above T&Ps are to be deployed by contractor as and when required as per instruction of BHEL engineer unless otherwise specified. If works gets delayed due to non-availability of above T&Ps, BHEL reserves the right to procure/hire the equipment/T&P and get the work done and charge the contractor as per current market rate/hiring rate + applicable BHEL overhead.
5. This above list of T&Ps is only indicative and neither exhaustive nor limiting. Quantities indicated above are only the minimum required. Contractor shall deploy all necessary T&P to meet the schedules & as prescribed by BHEL engineer and required for completion of work.
6. Necessary electrical / water / air connection required for operation of any of the tools & tackles shall be to Contractor 's account.
7. Contractor has to submit the Calibration certificates of all the precision Equipement to BHEL. BHEL may ask for recalibration of the MME"s /precision equipments for ensuring quality of work. Contractor must reascertain/ recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration/ deployment.
8. Any T&P"s, Cranes, Slings, D-shackles and other lifting tackles, Trailers required for shifting of material from store to site shall be arranged by contractor over and above T&P"s/ crane provided by BHEL.
9. If the work related to T & Ps mentioned above is completed then, BHEL can release that T & P during contract period / extended period if any. However, written permission shall be taken by contractor from BHEL construction Manager for releasing the T&P.
10. T&P mentioned in Sr no 1,2 & 3 may be allowed to demobilized and taken out by the bidder with written permission from BHEL site construction Manager on completion of work for which said T&P was required.

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Annexure-B

TENTATIVE LIST OF T&Ps TO BE PROVIDED BY BHEL ON SHARING BASIS

SN	DESCRIPTION OF EQUIPMENTS	CAPACITY (MINIMUM)	MINIMUM QUANTITY	REMARKS
1	Industrial Air Blower and accessories with power cable	20,000 m3/hr	As required.	For ATT of ducts and absorber

NOTE:

01	Contractor shall transport from BHEL stores, install, operate, carry out maintenance, dismantle after use and return to BHEL stores T&Ps mentioned above for his use.
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Annexure-I

	<p style="text-align: center;">SAFETY PLAN</p> <ol style="list-style-type: none"> 01. Safety Policy of the Contractor to be enclosed: 02. When was the Safety Policy last reviewed: 03. Details of implementation procedure / methods to implement Safety Policy / Safety Rules: 04. Name, Qualification, experience of Safety Officer 05. Review of Accidents Analysis Method, Methods to ensure Safety and Health: 06. Unit executive responsible to ensure Safety at various levels in work area: 07. List of employees trained in safety employed before execution of the job. Give the details of training: 08. Safety Training Targets, Schedules, methods Adopting to providing safety training to all employees: 09. Details of checklist for different jobs / work and responsible person to ensure compliance (copy of checklist to be enclosed): 10. Regular Safety Inspection Methods and Periodicity and list of members to be enclosed: 11. Risk Assessment, Safety Audit by Professional Agencies, Periodicity: 12. Implementation of Recommendations of Audit / Inspections. Procedures for implementation and follow up: 13. Provision for treatment of injured persons at work site: 14. Review of overall safety by top Management and Periodicity: 15. System for Implementation of Statutory legislations: 16. Issue of PPEs to employees, Periodicity / stock on hand etc:
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Annexure-II

Weight Summary for the E/T/C of the FGD System				
Sl.no.	Unit	DescriptionofSupplies	Tonnage (MT)	Remarks
1	Ranipet	FGD System (Mechanical)	12092.64	Annexure-III,IV
2	PSER/TRIC HY	Fabricated structural steel incl. materials handling.	6290	
3	PEM	Mechanical BOIs	46.54	Annexure-V
4	PC Chennai	PipingSystem	208.70	Annexure-VI
5	Bhopal	Motors	261.6	Annexure-VII
6	PESD	Fire Protection System	141.86	Annexure-VIII
7	TRICHY VALVE	Various types of valve	66.54	Annexure-IX
8	HPEP	Wet Ball Mill & Limestone Day Silo	2200.40	Annexure-X
9	ISG	DG SET	35	Annexure-XI
		TotalTonnage	21343	(AROUND)
Notes:				
1.	Weight mentioned in the annexures II,III,IV,V,VI,VII,VIII IX,X,XI are tentative only and based on the engineering/drawings/documents/inputs from MUs available as on date of NITand liable for variation.			
2.	The contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commissioning the FGD system in all respects as detailed in tender specifications and as per the drawings/documents for which payments shall be released on finally accepted tonnage rates.			
3.	The contractor undertakes to erect/commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same.			

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Annexure-III

A.	Product Group (PG) Wise Weight Schedule for FGD system (BHEL Ranipet Supply for 04 units & common systems) + PSER/Trichy supplied shop fabricated steel structures		
SL NO.	Total Weight under the FGD system including common system:	18383 MT	Ref. Rate Sch. Item no.
I.	Structure,Duct/Dampers	(10461 + 6290) MT i.e 16751 MT	STRUCTURE, DUCT/DAMPER (1.1)
II.	Tanks	62 MT	TANKS (1.2)
III.	Rotating Machines	491 MT	ROTATING MACHINE (1.3)
IV.	Insulation	294 MT	INSULATION (1.4)
V.	Piping & valves	774 MT	CS PIPING (1.5.2)
VI	MISC EQUIPMENT/STRL STEEL	10 MT	MISC EQUIPMENT/STRL STEEL (1.6)

CUST	PGMA	DPN	DESCRIPTION	EST / DESG WT(Kg)	Category/ Sub Group
G201	55081	30	BUF FIX MATERIAL	1721.588	STRUCTURE, DUCT/DAMPER (1.1)
G201	55082	25	BUF STAIR & HANDRAILS	1393.396	STRUCTURE, DUCT/DAMPER (1.1)
G201	55084	415	BOOSTER COOLING/SEAL FAN AIR FAN	3000	ROTATING MACHINE (1.3)
G201	55085	631	BUF CPLNG GUARD	80	ROTATING MACHINE (1.3)
G201	55089	50	BOOSTER FAN CANOPY FOR MOTOR	783.192	STRUCTURE, DUCT/DAMPER (1.1)
G201	55091	625	FIRST FILL LUBRICANT	1680	ROTATING MACHINE (1.3)
G201	55286	295	1 STG BOOSTER FAN ROTOR	8827.58	ROTATING MACHINE (1.3)
G201	55480	296	BUF SET & INDN SHAFT	828.139	ROTATING MACHINE (1.3)
G201	55580	171	BUF EXPN JOINTS	845.536	ROTATING MACHINE (1.3)
G201	55586	170	1 STG BUF HOUSING	25221.932	ROTATING MACHINE (1.3)
G201	55786	172	BUF SUCTION BOX	10776.704	ROTATING MACHINE (1.3)
G201	55880	630	BOOSTER FAN COUPLING	1000	ROTATING MACHINE (1.3)
G201	55886	173	BUF DIFFUSER	9502.924	ROTATING MACHINE (1.3)
G201	55980	755	BOOSTER FAN LOS SYSTEM	3000	ROTATING MACHINE (1.3)
G201	55983	615	BOOSTER FAN ACTUATOR	100	ROTATING MACHINE (1.3)

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G201	57141	195	SEAL AIR HAG AND ID FAN OUTGAT	11875	STRUCTURE, DUCT/DAMPER (1.1)
G201	57209	15	MTG BKT FOR CL DAMPER AIR CYL	546	STRUCTURE, DUCT/DAMPER (1.1)
G201	57466	105	PLATFORMS AND LADDERS	10500	STRUCTURE, DUCT/DAMPER (1.1)
G201	57491	390	BLOWER WITH MOTOR	8000	ROTATING MACHINE (1.3)
G201	57497	95	KNIFE GATE VALVE	6625	STRUCTURE, DUCT/DAMPER (1.1)
G201	57540	10	GATE-FGD BOOSTER FAN INLET	19127.02	STRUCTURE, DUCT/DAMPER (1.1)
G201	57550	110	GATE-FGD BOOSTER FAN OUTLET	21985.516	STRUCTURE, DUCT/DAMPER (1.1)
G201	57566	90	PLATFORMS AND LADDERS-FGD GD	3750	STRUCTURE, DUCT/DAMPER (1.1)
G201	57577	445	ELECT ACTUATOR FOR GATE,DAMPER	6000	STRUCTURE, DUCT/DAMPER (1.1)
G201	57583	5	DAMPER FGD BYPASS	18494.966	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW201	223	ABSORB. RC PUMP NOZZLE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW202	224	ABS NOZL NB 300 & ABOVE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW203	226	NOZZLE NB25 TO NB250	2000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW209	227	MAN HOLE DOOR FOR ABSORBER	2000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW213	705	ABSORBER SYSTEM INTERNALS	12000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW214	155	ABS BAFFLE GRATING	5000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW215	740	MIST ELIMINATOR & ACCESSORIES	22000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW216	100	ABS BAFFLE GRATING SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW217	215	ABS ME SUPPORT	15000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW218	120	ABS SPRAY PIPE SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW219	35	ABSORBER SYSTEM-BASE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW221	135	ABSORBER SYSTEM-CASING BOTTOM	118000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW222	230	ABSORBER SYSTEM-CASING TOP	88000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW223	760	ABSORBER SYSTEM ACCESSORIES	10000	STRUCTURE, DUCT/DAMPER (1.1)

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G201	FW224	228	ABSORBER SYSTEM-LINING-C276	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW226	125	EMERGENCY QUENCH WATER TANK	9538.15	TANKS (1.2)
G201	FW227	420	EMERGENCY QUENCH SYSTEM	6000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW228	395	ABSORBER-W/D INTERFACE	9000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW229	425	W/D WASH SYSTEM	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW231	240	ABSORBER SHEAR PLATE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW232	185	DUCT SUP BYP & BUF/GGH	48000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW233	200	DUCT SUPPORT BUF/GGH & ABS	36000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW234	210	DUCT SUP ABS & STACK/BYP	14000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW235	640	SPECIAL FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW236	175	STRUCTURES FOR RC PUMP HOUSE	70000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW237	145	GALLERIES & RAILING FOR STAIR	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW238	20	HOOK UP DUCT WITH STRUCTURE	14468.383	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW239	385	VIEWING PORTS	1000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW243	710	SLURRY DIST RC PUMP & ABS	20000	ROTATING MACHINE (1.3)
G201	FW244	690	OXIDATION AIR DISTRIBUTION SYS	7000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW249	800	HANDLING EQUIP- RC PUMP	35000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW250	400	FLOOR GRILLS -UNIT SYS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW251	115	EXPNSN JNT METALLIC	35253.934	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW252	440	EXPNSN JNT NON METALLIC	5000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW255	190	DUCT BYP & BUF/GGH/ABS	236618.76	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW256	205	DUCT BUF/GGH & ABS	193467.248	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW257	225	DUCT ABS & BYP/STACK	91000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW260	260	DUCT STR BYP & BUF/GGH/ABS	96118.751	STRUCTURE, DUCT/DAMPER (1.1)

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G201	FW261	275	DUCT STR BUF/GGH & ABS	225064.057	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW262	325	DUCT STR ABS & BYP/STACK	75178.773	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW267	665	INSULATION MATERIALS FOR DUCT	72000	INSULATION (1.4)
G201	FW268	650	FIXING COMP FOR DUCT	36000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW269	655	CLADDING SHEET FOR DUCT	36000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW280	60	FOUNDATION MATL FOR DUCT STRUC	12914.276	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW281	160	FOUNDATION MATL FOR ABS	3467.896	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW282	70	FOUNDATION MATL FOR ELEVATOR	3874.456	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW283	75	FOUNDATION MATL RC PUMP SHED	1023.44	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW285	85	SUPRTING STR FOR EMERGENCY QWT	5043.177	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW292	245	STRUCTURES FOR ELEVATOR	90000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW293	735	ELEVATOR AND ACCESSORIES	12000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW300	231	ABSORBER COLUMNS	44458.59	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW301	232	ABSORBER BEAMS AND BRACINGS	86365.033	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW302	233	ABSORBER LOWER FLOORS	9927.347	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW303	234	ABSORBER UPPER FLOORS	5738.255	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW304	235	ABSORBER FLOOR GRILLS	30000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW305	236	ABSORBER STAIRS & HANDRAILS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW306	237	ABSORBER HSFG FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW307	238	ABSORBER MISCELLANEOUS	2000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW310	180	STRU FOR BOOSTER FAN HANDLING	25000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW322	229	ABSORBER SYSTEM-CASING INTERM	70000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW612	305	GALLARIES AND RAILINGS FOR DAM	15000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW613	300	GALLARIES AND RAILINGS FOR DUC	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW820	590	MOTOR BTRFLY VALV-LS SLRY	10000	CS PIPING (1.5.2)

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G202	55081	30	BUF FIX MATERIAL	1721.588	STRUCTURE, DUCT/DAMPER (1.1)
G202	55082	25	BUF STAIR & HANDRAILS	1393.396	STRUCTURE, DUCT/DAMPER (1.1)
G202	55084	415	BOOSTER COOLING/SEAL FAN AIR FAN	3000	ROTATING MACHINE (1.3)
G202	55085	631	BUF CPLNG GUARD	80	ROTATING MACHINE (1.3)
G202	55089	50	BOOSTER FAN CANOPY FOR MOTOR	783.192	STRUCTURE, DUCT/DAMPER (1.1)
G202	55091	625	FIRST FILL LUBRICANT	1680	ROTATING MACHINE (1.3)
G202	55286	295	1 STG BOOSTER FAN ROTOR	8827.58	ROTATING MACHINE (1.3)
G202	55480	296	BUF SET & INDN SHAFT	828.139	ROTATING MACHINE (1.3)
G202	55580	171	BUF EXPN JOINTS	845.536	ROTATING MACHINE (1.3)
G202	55586	170	1 STG BUF HOUSING	25221.932	ROTATING MACHINE (1.3)
G202	55786	172	BUF SUCTION BOX	10776.704	ROTATING MACHINE (1.3)
G202	55880	630	BOOSTER FAN COUPLING	1000	ROTATING MACHINE (1.3)
G202	55886	173	BUF DIFFUSER	9502.924	ROTATING MACHINE (1.3)
G202	55980	755	BOOSTER FAN LOS SYSTEM	3000	ROTATING MACHINE (1.3)
G202	55983	615	BOOSTER FAN ACTUATOR	100	ROTATING MACHINE (1.3)
G202	57141	195	SEAL AIR HAG AND ID FAN OUTGAT	11875	STRUCTURE, DUCT/DAMPER (1.1)
G202	57209	15	MTG BKT FOR CL DAMPER AIR CYL	546	STRUCTURE, DUCT/DAMPER (1.1)
G202	57466	105	PLATFORMS AND LADDERS	10500	STRUCTURE, DUCT/DAMPER (1.1)
G202	57491	390	BLOWER WITH MOTOR	8000	ROTATING MACHINE (1.3)
G202	57497	95	KNIFE GATE VALVE	6625	STRUCTURE, DUCT/DAMPER (1.1)
G202	57540	10	GATE-FGD BOOSTER FAN INLET	19127.02	STRUCTURE, DUCT/DAMPER (1.1)
G202	57550	110	GATE-FGD BOOSTER FAN OUTLET	21985.516	STRUCTURE, DUCT/DAMPER (1.1)
G202	57566	90	PLATFORMS AND LADDERS-FGD GD	3750	STRUCTURE, DUCT/DAMPER (1.1)
G202	57577	445	ELECT ACTUATOR FOR GATE,DAMPER	6000	STRUCTURE, DUCT/DAMPER (1.1)

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G202	57583	5	DAMPER FGD BYPASS	17465.976	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW201	223	ABSORB. RC PUMP NOZZLE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW202	224	ABS NOZL NB 300 & ABOVE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW203	226	NOZZLE NB25 TO NB250	2000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW209	227	MAN HOLE DOOR FOR ABSORBER	2000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW213	705	ABSORBER SYSTEM INTERNALS	12000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW214	155	ABS BAFFLE GRATING	5000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW215	740	MIST ELIMINATOR & ACCESSORIES	22000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW216	100	ABS BAFFLE GRATING SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW217	215	ABS ME SUPPORT	15000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW218	120	ABS SPRAY PIPE SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW219	35	ABSORBER SYSTEM-BASE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW221	135	ABSORBER SYSTEM-CASING BOTTOM	118000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW222	230	ABSORBER SYSTEM-CASING TOP	88000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW223	760	ABSORBER SYSTEM ACCESSORIES	10000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW224	228	ABSORBER SYSTEM-LINING-C276	10000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW226	125	EMERGENCY QUENCH WATER TANK	9538.15	TANKS (1.2)
G202	FW227	420	EMERGENCY QUENCH SYSTEM	6000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW228	395	ABSORBER-W/D INTERFACE	9000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW229	425	W/D WASH SYSTEM	10000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW231	240	ABSORBER SHEAR PLATE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW232	185	DUCT SUP BYP & BUF/GGH	48000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW233	200	DUCT SUPPORT BUF/GGH & ABS	36000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW234	210	DUCT SUP ABS & STACK/BYP	14000	STRUCTURE, DUCT/DAMPER (1.1)

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G202	FW235	640	SPECIAL FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW236	175	STRUCTURES FOR RC PUMP HOUSE	70000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW237	145	GALLERIES & RAILING FOR STAIR	10000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW238	20	HOOK UP DUCT WITH STRUCTURE	14468.383	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW239	385	VIEWING PORTS	1000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW243	710	SLURRY DIST RC PUMP & ABS	20000	ROTATING MACHINE (1.3)
G202	FW244	690	OXIDATION AIR DISTRIBUTION SYS	7000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW249	800	HANDLING EQUIP- RC PUMP	35000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW250	400	FLOOR GRILLS -UNIT SYS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW251	115	EXPNSN JNT METALLIC	35253.934	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW252	440	EXPNSN JNT NON METALLIC	5000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW255	190	DUCT BYP & BUF/GGH/ABS	234131.969	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW256	205	DUCT BUF/GGH & ABS	167617.722	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW257	225	DUCT ABS & BYP/STACK	91000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW260	260	DUCT STR BYP & BUF/GGH/ABS	104140.025	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW261	275	DUCT STR BUF/GGH & ABS	215776.134	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW262	325	DUCT STR ABS & BYP/STACK	75178.773	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW267	665	INSULATION MATERIALS FOR DUCT	73000	INSULATION (1.4)
G202	FW268	650	FIXING COMP FOR DUCT	36500	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW269	655	CLADDING SHEET FOR DUCT	36500	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW280	60	FOUNDATION MATL FOR DUCT STRUC	13550.964	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW281	160	FOUNDATION MATL FOR ABS	3467.896	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW282	70	FOUNDATION MATL FOR ELEVATOR	3874.456	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW283	75	FOUNDATION MATL RC PUMP SHED	1023.44	STRUCTURE, DUCT/DAMPER (1.1)

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G202	FW285	85	SUPRTING STR FOR EMERGENCY QWT	5043.177	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW292	245	STRUCTURES FOR ELEVATOR	90000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW293	735	ELEVATOR AND ACCESSORIES	12000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW300	231	ABSORBER COLUMNS	44458.59	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW301	232	ABSORBER BEAMS AND BRACINGS	86365.033	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW302	233	ABSORBER LOWER FLOORS	9927.347	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW303	234	ABSORBER UPPER FLOORS	5738.255	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW304	235	ABSORBER FLOOR GRILLS	30000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW305	236	ABSORBER STAIRS & HANDRAILS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW306	237	ABSORBER HSFG FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW307	238	ABSORBER MISCELLANEOUS	2000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW310	180	STRU FOR BOOSTER FAN HANDLING	25000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW322	229	ABSORBER SYSTEM-CASING INTERM	70000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW612	305	GALLARIES AND RAILINGS FOR DAM	15000	STRUCTURE, DUCT/DAMPER (1.1)
G202	FW613	300	GALLARIES AND RAILINGS FOR DUC	10000	STRUCTURE, DUCT/DAMPER (1.1)
G203	55081	30	BUF FIX MATERIAL	1721.588	STRUCTURE, DUCT/DAMPER (1.1)
G203	55082	25	BUF STAIR & HANDRAILS	1393.396	STRUCTURE, DUCT/DAMPER (1.1)
G203	55084	415	BOOSTER COOLING/SEAL FAN AIR FAN	3000	ROTATING MACHINE (1.3)
G203	55085	631	BUF CPLNG GUARD	80	ROTATING MACHINE (1.3)
G203	55089	50	BOOSTER FAN CANOPY FOR MOTOR	783.192	STRUCTURE, DUCT/DAMPER (1.1)
G203	55091	625	FIRST FILL LUBRICANT	1680	ROTATING MACHINE (1.3)
G203	55286	295	1 STG BOOSTER FAN ROTOR	8827.58	ROTATING MACHINE (1.3)
G203	55480	296	BUF SET & INDN SHAFT	828.139	ROTATING MACHINE (1.3)
G203	55580	171	BUF EXPN JOINTS	845.536	ROTATING MACHINE (1.3)

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G203	55586	170	1 STG BUF HOUSING	25221.932	ROTATING MACHINE (1.3)
G203	55786	172	BUF SUCTION BOX	10776.704	ROTATING MACHINE (1.3)
G203	55880	630	BOOSTER FAN COUPLING	1000	ROTATING MACHINE (1.3)
G203	55886	173	BUF DIFFUSER	9502.924	ROTATING MACHINE (1.3)
G203	55980	755	BOOSTER FAN LOS SYSTEM	3000	ROTATING MACHINE (1.3)
G203	55983	615	BOOSTER FAN ACTUATOR	100	ROTATING MACHINE (1.3)
G203	57141	195	SEAL AIR HAG AND ID FAN OUTGAT	11875	STRUCTURE, DUCT/DAMPER (1.1)
G203	57209	15	MTG BKT FOR CL DAMPER AIR CYL	546	STRUCTURE, DUCT/DAMPER (1.1)
G203	57466	105	PLATFORMS AND LADDERS	10500	STRUCTURE, DUCT/DAMPER (1.1)
G203	57491	390	BLOWER WITH MOTOR	8000	ROTATING MACHINE (1.3)
G203	57497	95	KNIFE GATE VALVE	6625	STRUCTURE, DUCT/DAMPER (1.1)
G203	57540	10	GATE-FGD BOOSTER FAN INLET	19127.02	STRUCTURE, DUCT/DAMPER (1.1)
G203	57550	110	GATE-FGD BOOSTER FAN OUTLET	21985.516	STRUCTURE, DUCT/DAMPER (1.1)
G203	57566	90	PLATFORMS AND LADDERS-FGD GD	3750	STRUCTURE, DUCT/DAMPER (1.1)
G203	57577	445	ELECT ACTUATOR FOR GATE,DAMPER	6000	STRUCTURE, DUCT/DAMPER (1.1)
G203	57583	5	DAMPER FGD BYPASS	18494.966	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW201	223	ABSORB. RC PUMP NOZZLE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW202	224	ABS NOZL NB 300 & ABOVE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW203	226	NOZZLE NB25 TO NB250	2000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW209	227	MAN HOLE DOOR FOR ABSORBER	2000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW213	705	ABSORBER SYSTEM INTERNALS	12000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW214	155	ABS BAFFLE GRATING	5000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW215	740	MIST ELIMINATOR & ACCESSORIES	22000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW216	100	ABS BAFFLE GRATING SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)

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G203	FW217	215	ABS ME SUPPORT	15000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW218	120	ABS SPRAY PIPE SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW219	35	ABSORBER SYSTEM-BASE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW221	135	ABSORBER SYSTEM-CASING BOTTOM	118000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW222	230	ABSORBER SYSTEM-CASING TOP	88000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW223	760	ABSORBER SYSTEM ACCESSORIES	10000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW224	228	ABSORBER SYSTEM-LINING-C276	10000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW226	125	EMERGENCY QUENCH WATER TANK	9538.15	TANKS (1.2)
G203	FW227	420	EMERGENCY QUENCH SYSTEM	6000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW228	395	ABSORBER-W/D INTERFACE	9000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW229	425	W/D WASH SYSTEM	10000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW231	240	ABSORBER SHEAR PLATE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW232	185	DUCT SUP BYP & BUF/GGH	48000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW233	200	DUCT SUPPORT BUF/GGH & ABS	36000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW234	210	DUCT SUP ABS & STACK/BYP	14000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW235	640	SPECIAL FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW236	175	STRUCTURES FOR RC PUMP HOUSE	70000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW237	145	GALLERIES & RAILING FOR STAIR	10000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW238	20	HOOK UP DUCT WITH STRUCTURE	14468.383	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW239	385	VIEWING PORTS	1000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW243	710	SLURRY DIST RC PUMP & ABS	20000	ROTATING MACHINE (1.3)
G203	FW244	690	OXIDATION AIR DISTRIBUTION SYS	7000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW249	800	HANDLING EQUIP- RC PUMP	35000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW250	400	FLOOR GRILLS -UNIT SYS	20000	STRUCTURE, DUCT/DAMPER (1.1)

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G203	FW251	115	EXPNSN JNT METALLIC	38203.878	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW252	440	EXPNSN JNT NON METALLIC	5000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW255	190	DUCT BYP & BUF/GGH/ABS	221893.187	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW256	205	DUCT BUF/GGH & ABS	185077.426	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW257	225	DUCT ABS & BYP/STACK	91000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW260	260	DUCT STR BYP & BUF/GGH/ABS	289000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW261	275	DUCT STR BUF/GGH & ABS	211000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW262	325	DUCT STR ABS & BYP/STACK	75178.773	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW267	665	INSULATION MATERIALS FOR DUCT	73000	INSULATION (1.4)
G203	FW268	650	FIXING COMP FOR DUCT	36500	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW269	655	CLADDING SHEET FOR DUCT	36500	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW280	60	FOUNDATION MATL FOR DUCT STRUC	10438.776	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW281	160	FOUNDATION MATL FOR ABS	3467.896	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW282	70	FOUNDATION MATL FOR ELEVATOR	3874.456	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW283	75	FOUNDATION MATL RC PUMP SHED	1023.44	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW285	85	SUPRTING STR FOR EMERGENCY QWT	5043.177	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW292	245	STRUCTURES FOR ELEVATOR	90000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW293	735	ELEVATOR AND ACCESSORIES	12000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW300	231	ABSORBER COLUMNS	44458.59	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW301	232	ABSORBER BEAMS AND BRACINGS	86365.033	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW302	233	ABSORBER LOWER FLOORS	9927.347	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW303	234	ABSORBER UPPER FLOORS	5738.255	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW304	235	ABSORBER FLOOR GRILLS	30000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW305	236	ABSORBER STAIRS & HANDRAILS	20000	STRUCTURE, DUCT/DAMPER (1.1)

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G203	FW306	237	ABSORBER HSFG FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW307	238	ABSORBER MISCELLANEOUS	2000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW310	180	STRU FOR BOOSTER FAN HANDLING	25000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW322	229	ABSORBER SYSTEM-CASING INTERM	70000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW612	305	GALLARIES AND RAILINGS FOR DAM	15000	STRUCTURE, DUCT/DAMPER (1.1)
G203	FW613	300	GALLARIES AND RAILINGS FOR DUC	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	55081	30	BUF FIX MATERIAL	1721.588	STRUCTURE, DUCT/DAMPER (1.1)
G204	55082	25	BUF STAIR & HANDRAILS	1393.396	STRUCTURE, DUCT/DAMPER (1.1)
G204	55084	415	BOOSTER COOLING/SEAL FAN AIR FAN	3000	ROTATING MACHINE (1.3)
G204	55085	631	BUF CPLNG GUARD	80	ROTATING MACHINE (1.3)
G204	55089	50	BOOSTER FAN CANOPY FOR MOTOR	783.192	STRUCTURE, DUCT/DAMPER (1.1)
G204	55091	625	FIRST FILL LUBRICANT	1680	ROTATING MACHINE (1.3)
G204	55286	295	1 STG BOOSTER FAN ROTOR	8827.58	ROTATING MACHINE (1.3)
G204	55480	296	BUF SET & INDN SHAFT	828.139	ROTATING MACHINE (1.3)
G204	55580	171	BUF EXPN JOINTS	845.536	ROTATING MACHINE (1.3)
G204	55586	170	1 STG BUF HOUSING	25221.932	ROTATING MACHINE (1.3)
G204	55786	172	BUF SUCTION BOX	10776.704	ROTATING MACHINE (1.3)
G204	55880	630	BOOSTER FAN COUPLING	1000	ROTATING MACHINE (1.3)
G204	55886	173	BUF DIFFUSER	9502.924	ROTATING MACHINE (1.3)
G204	55980	755	BOOSTER FAN LOS SYSTEM	3000	ROTATING MACHINE (1.3)
G204	55983	615	BOOSTER FAN ACTUATOR	100	ROTATING MACHINE (1.3)
G204	57141	195	SEAL AIR HAG AND ID FAN OUTGAT	11875	STRUCTURE, DUCT/DAMPER (1.1)
G204	57209	15	MTG BKT FOR CL DAMPER AIR CYL	546	STRUCTURE, DUCT/DAMPER (1.1)
G204	57466	105	PLATFORMS AND LADDERS	10500	STRUCTURE, DUCT/DAMPER (1.1)

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G204	57491	390	BLOWER WITH MOTOR	8000	ROTATING MACHINE (1.3)
G204	57497	95	KNIFE GATE VALVE	6625	STRUCTURE, DUCT/DAMPER (1.1)
G204	57540	10	GATE-FGD BOOSTER FAN INLET	19127.02	STRUCTURE, DUCT/DAMPER (1.1)
G204	57550	110	GATE-FGD BOOSTER FAN OUTLET	21985.516	STRUCTURE, DUCT/DAMPER (1.1)
G204	57566	90	PLATFORMS AND LADDERS-FGD GD	3750	STRUCTURE, DUCT/DAMPER (1.1)
G204	57577	445	ELECT ACTUATOR FOR GATE,DAMPER	6000	STRUCTURE, DUCT/DAMPER (1.1)
G204	57583	5	DAMPER FGD BYPASS	17494.966	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW201	223	ABSORB. RC PUMP NOZZLE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW202	224	ABS NOZL NB 300 & ABOVE	2000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW203	226	NOZZLE NB25 TO NB250	2000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW209	227	MAN HOLE DOOR FOR ABSORBER	2000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW213	705	ABSORBER SYSTEM INTERNALS	12000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW214	155	ABS BAFFLE GRATING	5000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW215	740	MIST ELIMINATOR & ACCESSORIES	22000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW216	100	ABS BAFFLE GRATING SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW217	215	ABS ME SUPPORT	15000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW218	120	ABS SPRAY PIPE SUPP	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW219	35	ABSORBER SYSTEM-BASE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW221	135	ABSORBER SYSTEM-CASING BOTTOM	118000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW222	230	ABSORBER SYSTEM-CASING TOP	88000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW223	760	ABSORBER SYSTEM ACCESSORIES	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW224	228	ABSORBER SYSTEM-LINING-C276	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW226	125	EMERGENCY QUENCH WATER TANK	9538.15	TANKS (1.2)
G204	FW227	420	EMERGENCY QUENCH SYSTEM	6000	STRUCTURE, DUCT/DAMPER (1.1)

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G204	FW228	395	ABSORBER-W/D INTERFACE	9000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW229	425	W/D WASH SYSTEM	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW231	240	ABSORBER SHEAR PLATE	8000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW232	185	DUCT SUP BYP & BUF/GGH	52000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW233	200	DUCT SUPPORT BUF/GGH & ABS	45912.174	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW234	210	DUCT SUP ABS & STACK/BYP	14000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW235	640	SPECIAL FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW236	175	STRUCTURES FOR RC PUMP HOUSE	70000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW237	145	GALLERIES & RAILING FOR STAIR	10000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW238	20	HOOK UP DUCT WITH STRUCTURE	14468.383	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW239	385	VIEWING PORTS	1000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW243	710	SLURRY DIST RC PUMP & ABS	20000	ROTATING MACHINE (1.3)
G204	FW244	690	OXIDATION AIR DISTRIBUTION SYS	7000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW249	800	HANDLING EQUIP- RC PUMP	35000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW250	400	FLOOR GRILLS -UNIT SYS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW251	115	EXPNSN JNT METALLIC	35253.934	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW252	440	EXPNSN JNT NON METALLIC	5000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW255	190	DUCT BYP & BUF/GGH/ABS	212593.516	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW256	205	DUCT BUF/GGH & ABS	205617.352	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW257	225	DUCT ABS & BYP/STACK	91000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW260	260	DUCT STR BYP & BUF/GGH/ABS	310000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW261	275	DUCT STR BUF/GGH & ABS	211000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW262	325	DUCT STR ABS & BYP/STACK	75178.773	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW267	665	INSULATION MATERIALS FOR DUCT	76000	INSULATION (1.4)

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G204	FW268	650	FIXING COMP FOR DUCT	38000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW269	655	CLADDING SHEET FOR DUCT	38000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW280	60	FOUNDATION MATL FOR DUCT STRUC	10476.192	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW281	160	FOUNDATION MATL FOR ABS	3467.896	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW282	70	FOUNDATION MATL FOR ELEVATOR	3874.456	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW283	75	FOUNDATION MATL RC PUMP SHED	1023.44	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW285	85	SUPRTING STR FOR EMERGENCY QWT	5043.177	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW292	245	STRUCTURES FOR ELEVATOR	90000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW293	735	ELEVATOR AND ACCESSORIES	12000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW300	231	ABSORBER COLUMNS	44458.59	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW301	232	ABSORBER BEAMS AND BRACINGS	86365.033	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW302	233	ABSORBER LOWER FLOORS	9927.347	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW303	234	ABSORBER UPPER FLOORS	5738.255	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW304	235	ABSORBER FLOOR GRILLS	30000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW305	236	ABSORBER STAIRS & HANDRAILS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW306	237	ABSORBER HSFG FASTNERS	5000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW307	238	ABSORBER MISCELLANEOUS	2000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW310	180	STRU FOR BOOSTER FAN HANDLING	25000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW322	229	ABSORBER SYSTEM-CASING INTERM	70000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW612	305	GALLARIES AND RAILINGS FOR DAM	15000	STRUCTURE, DUCT/DAMPER (1.1)
G204	FW613	300	GALLARIES AND RAILINGS FOR DUC	10000	STRUCTURE, DUCT/DAMPER (1.1)

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ANNEXURE-IV(RANIPET SUPPLIED COMMON SYSTEM)

CUST	PGMA	DPN	DESCRIPTION	EST / DESG WT(Kg)	Category/ Sub Group
G201	55000	345	FAN TOOL & FIXTURE	300	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW701	465	SLURRY PUMPS & ACCESSORIES	50000	ROTATING MACHINE (1.3)
G201	FW702	450	WATER PUMPS & ACCESSORIES	10000	ROTATING MACHINE (1.3)
G201	FW710	255	MONORAIL FOR HOIST & CRANES	60000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW712	315	FLOOR GRILLS-COMM SYS	55000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW713	785	CHAIN PULLEYS	20000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW714	795	HOISTS	23000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW717	695	MAN HOLE DOOR	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW720	805	AGITATORS	60000	ROTATING MACHINE (1.3)
G201	FW725	560	NOZZLES & FLANGES	3000	CS PIPING (1.5.2)
G201	FW751	715	PROCESS WATER PIPE ACCESSORIES	36000	CS PIPING (1.5.2)
G201	FW752	700	COOLING WATER PIPE ACCESSORIES	10000	CS PIPING (1.5.2)
G201	FW753	730	SLURRY PIPE ACCESSORIES	400000	CS PIPING (1.5.2)
G201	FW754	725	SERVICE AIR PIPE ACCESSORIES	200000	CS PIPING (1.5.2)
G201	FW755	720	INSTRUMENT AIR PIPE ACCESSORIE	40000	CS PIPING (1.5.2)
G201	FW760	310	FOUNDATION MATL FOR PIPE RACKS	15000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW761	375	STRUCTURE FOR PIPERACKS	311000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW763	290	FNDN MATL SUB PIPE RACK	5000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW766	365	PLATFORM FOR PIPE RACK	88000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW767	340	PLATFORM SUB PIPE RACK	15000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW768	380	TRESTLE FOR MAIN PIPE RACK	395000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW769	355	TRESTLE-SUB PIPE RACK	30000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW779	370	SUPPORTS FOR CABLE TRAYS/CONTR	153000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW784	140	HSFG BOLTS	120000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW786	150	PRIMARY HYDROCYCLONE FEED TANK	14000	TANK (1.2)
G201	FW798	645	AIR RECEIVERS	10000	TANK (1.2)

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G201	FW814	765	ROOFING SHEET	10000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW815	605	RC PUMP INLT & OUTLT VALVE	45000	STRUCTURE, DUCT/DAMPER (1.1)
G201	FW816	565	MANL BTRFLY VALV- UTLTY	3500	CS PIPING (1.5.2)
G201	FW817	525	MOTOR BTRFL VALV-UTLTY	2000	CS PIPING (1.5.2)
G201	FW818	480	PNEM BTRFLY VALV-UTLTY	1500	CS PIPING (1.5.2)
G201	FW819	570	MAN BTRFLY VALV-LS SLRY	5000	CS PIPING (1.5.2)
G201	FW820	590	MOTOR BTRFLY VALV-LS SLRY	10000	CS PIPING (1.5.2)
G201	FW821	530	PNEUM BTRFLY VALV-LS SLRY	2000	CS PIPING (1.5.2)
G201	FW822	580	MAN BTRFLY VALV-GYP SLRY	5500	CS PIPING (1.5.2)
G201	FW823	595	MOTOR BTRFLY VALV -GYP SLRY	10000	CS PIPING (1.5.2)
G201	FW824	535	PNEUM BTRFLY VALV-GYP SLRY	2000	CS PIPING (1.5.2)
G201	FW825	485	MAN BTRFLY VALV-AIR	1500	CS PIPING (1.5.2)
G201	FW826	540	MOTOR BTRFLY VALV-AIR	2000	CS PIPING (1.5.2)
G201	FW827	550	PNEUM BTRFLY VALV-AIR	2500	CS PIPING (1.5.2)
G201	FW828	600	MAN GATE VALV-UTLTY	15000	CS PIPING (1.5.2)
G201	FW829	490	MOTOR GATE VALV-UTLTY	1500	CS PIPING (1.5.2)
G201	FW830	495	PNEUM GATE VALVE-UTLTY	1500	CS PIPING (1.5.2)
G201	FW834	575	MAIN GLOBE VALV-UTLTY	5000	CS PIPING (1.5.2)
G201	FW840	475	CERAMIV VALVES	1000	CS PIPING (1.5.2)
G201	FW841	500	CONTROL VALVES	1500	CS PIPING (1.5.2)
G201	FW842	505	MAN PINCH VALV-GYP SLRY	1500	CS PIPING (1.5.2)
G201	FW845	510	BALL VALVES- WATER	1500	CS PIPING (1.5.2)
G201	FW848	515	CHECK VALVES- WATER	1500	CS PIPING (1.5.2)
G201	FW851	545	DIAPHRAGM VALV-SLURRY	2000	CS PIPING (1.5.2)
G201	FW854	585	ROOT VALV INSTRMNTN	5500	CS PIPING (1.5.2)
G201	FW988	770	COMMISSIONING SPARES	10000	MISC EQUIPMENT/STRL STEEL (1.6)

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Annexure-V

PEM Supplied BOIs Detail (only Mechanical)

SI No.	Item Description	UOM	Total	Total Weight in Tonnes	Category/Sub group
			Qty.		
1	ACW PUMPS (Hor)	Nos.	6	4.5	ROTATING MACHINE (1.3)
2	ECW PUMPS (Hor)	Nos.	5	3.75	ROTATING MACHINE (1.3)
3	Self Cleaning Strainers	Nos.	2	3	Misc. Eqpnt./Str steel (1.6)
4	CONICAL STRAINERS (200NB)	Nos.	5	1.25	Misc. Eqpnt./Str steel (1.6)
5	Heat Exchangers (Plate type)	Nos.	5	7.5	Misc. Eqpnt./Str steel (1.6)
6	NaOH Dosing System	Nos.	1	1	Misc. Eqpnt./Str steel (1.6)
7	ELECTRIC HOISTS	Nos.	3	3	Misc. Eqpnt./Str steel (1.6)
8	SG CRANE	Nos.	1	6	Misc. Eqpnt./Str steel (1.6)
9	Control Valve	Nos.	1	1.5	CS PIPING (1.5.2)
10	Flow Element-Orifice	Nos.	2	1	CS PIPING (1.5.2)
11	ROTAMETER/SFI	Nos.	16	4	CS PIPING (1.5.2)
12	Agitators	Nos.	15	10.04	CS PIPING (1.5.2)
				8.25	ROTATING MACHINE (1.3)
Total Weight of PEM Supplies (MT)				21.75	Misc. Eqpnt./Str steel (1.6)
				16.54	CS PIPING (1.5.2)
				46.54	

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Annexure-VI

Weight Schedule of Pipes (PC-Chennai)					
SL NO.	PG	MA	MARK NO./DESCRIPTION	WEIGHT (MT).	Category/Sub group
1	80	463	PIPE DIA 273.1 X 6.0EP-D-D1=261.1	3.04	CS PIPING (1.5.2)
2	80	463	PIPE DIA 219.1 X 6.0EP-D-D1=207.1	1.04	CS PIPING (1.5.2)
3	80	463	PIPENB150X5.4 EP-D-D1=156.8	1.28	CS PIPING (1.5.2)
4	80	463	PIPENB100X5.4 EP-D-D1=105.3	0.1	CS PIPING (1.5.2)
5	80	463	PIPENB80X 4.8 EP-D-D1=80.8	0.11	CS PIPING (1.5.2)
6	80	463	BW LR 90DEG MITRE BEND OD273X6	0.16	CS PIPING (1.5.2)
7	80	463	BW LR 90DEG MITRE BEND OD219.1X6.4	0.18	CS PIPING (1.5.2)
8	80	463	90DEG ELL NB150 IS1239 BLACK	0.34	CS PIPING (1.5.2)
9	80	463	90DEG ELL NB100 IS1239 BLACK	0.03	CS PIPING (1.5.2)
10	80	463	BL. 90 DEG ELL NB80 IS1239 BLACK	0.02	CS PIPING (1.5.2)
11	80	463	BW EQUAL TEE NB250	0.24	CS PIPING (1.5.2)
12	80	463	ASMEB16.9 BW EQUAL TEE OD88.9X5.49	0.01	CS PIPING (1.5.2)
13	80	463	ASMEB16.9 BWLR 45DEG ELBOW OD273X6.35	0.03	CS PIPING (1.5.2)
14	80	463	ASMEB16.9 UEQT OD273X6.35/114.3X6.02	0.03	CS PIPING (1.5.2)
15	80	463	ASMEB16.9 UEQT OD273X6.35/219.1X6.35	0.15	CS PIPING (1.5.2)
16	80	463	ASMEB16.9 UEQT OD273.1X6.35/168.3X7.11	0.32	CS PIPING (1.5.2)
17	80	463	ASMEB16.9 UEQT OD273X6.35/88.9X5.49	0.08	CS PIPING (1.5.2)

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18	80	463	P.F.REDUCER NB250/NB200	0.02	CS PIPING (1.5.2)
19	80	463	ASMEB16.9 RED OD273X6.35/168.3X7.11	0.06	CS PIPING (1.5.2)
20	80	463	ASMEB16.9 RED OD273X6.35/114.3X6.02	0.01	CS PIPING (1.5.2)
21	80	463	ASMEB16.9 RED OD114.3X6.02/88.9X5.49	0.002	CS PIPING (1.5.2)
22	80	463	BW ECCRED219.1X8.18/168.3X7.14SA2 34WPB	0.12	CS PIPING (1.5.2)
23	80	463	ASMEB16.9 RED OD168.3X7.11/114.3X6.02	0.02	CS PIPING (1.5.2)
24	80	463	SOW FLANGE NB 250 CL150 BMC16	0.13	CS PIPING (1.5.2)
25	80	463	SOW FLANGE NB 200 CL150	0.25	CS PIPING (1.5.2)
26	80	463	SOW FLANGE NB 150 CL150 BMC 16	0.22	CS PIPING (1.5.2)
27	80	463	SOW FLANGE NB 100 CL150 BMC 20	0.01	CS PIPING (1.5.2)
28	80	463	SOW FLANGE NB 80 CL150	0.03	CS PIPING (1.5.2)
29	80	463	SW STUB-CS-NB 25 CLASS 3000 CS SA105	0.03	CS PIPING (1.5.2)
30	80	463	SW STUB-CS-NB 50 CLASS 3000 CS	0.01	CS PIPING (1.5.2)
31	80	463	TEMP STUB RC 1" L=45CS	0.03	CS PIPING (1.5.2)
32	80	463	CARBON STEEL PLUG 1"	0.01	CS PIPING (1.5.2)
33	80	463	PLATE 10X300X300 -EP1	0.19	CS PIPING (1.5.2)
34	80	463	PLATE 10X250X250 -EP2	0.03	CS PIPING (1.5.2)
35	80	463	PLATE 10X400X400 -EP3	0.07	CS PIPING (1.5.2)
36	80	463	PIPE OD 323.9X6.4 E P-D-D1=312.0	80.14	CS PIPING (1.5.2)
37	80	463	PIPE OD 219.1X6.0 E P-D-D1=207.1	6.24	CS PIPING (1.5.2)

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38	80	463	PIPE NB 150X5.4 E P-D-D1=156.8	5.6	CS PIPING (1.5.2)
39	80	463	PIPE NB 80X 4.8 E P-D-D1=80.8	20	CS PIPING (1.5.2)
40	80	463	PIPE OD 323.9X6.4 E P-D-D1=312.0	36.19	CS PIPING (1.5.2)
41	80	463	PIPE OD 273.1X6.0 EP-D-D1=261.1	1.09	CS PIPING (1.5.2)
42	80	463	PIPE OD 219.1X6.0 E P-D-D1=207.1	9.36	CS PIPING (1.5.2)
43	80	463	PIPE NB 150X5.4 E P-D-D1=156.8	4.66	CS PIPING (1.5.2)
44	80	463	PIPE NB 100X5.4 E P-D-D1=105.3	0.16	CS PIPING (1.5.2)
45	80	463	PIPE NB 80X 4.8 E P-D-D1=80.8	1.56	CS PIPING (1.5.2)
46	80	463	PIPE NB50X4.50 BL E P STY-D; D1-52.7	0.17	CS PIPING (1.5.2)
47	80	463	PIPE NB25X4.0 BL EP STY-D; D1-26.9	0.33	CS PIPING (1.5.2)
48	80	463	SW STUB-CS-NB 25 CLASS 3000 CS SA105	0.02	CS PIPING (1.5.2)
49	80	463	SW STUB-CS-NB 50 CLASS 3000 CS	0.01	CS PIPING (1.5.2)
50	80	463	TEMP STUB RC 1" L=45 CS	0.02	CS PIPING (1.5.2)
51	80	463	CARBON STEEL PLUG 1"	0.004	CS PIPING (1.5.2)
52	80	463	BL. 90 DEG ELL NB25 IS1239 BLACK	0.004	CS PIPING (1.5.2)
53	80	463	BL. 90 DEG ELL NB50 IS1239 BLACK	0.01	CS PIPING (1.5.2)
54	80	463	BL. 90 DEG ELL NB80 IS1239 BLACK	0.07	CS PIPING (1.5.2)
55	80	463	BL. 90 DEG ELL NB100IS1239 BLACK	0.01	CS PIPING (1.5.2)
56	80	463	BL. 90 DEG ELL NB150IS1239 BLACK	0.17	CS PIPING (1.5.2)
57	80	463	BW LR 90DEG MITREBEND NB200	0.55	CS PIPING (1.5.2)
58	80	463	BW LR 90DEG MITREBEND NB250	0.13	CS PIPING (1.5.2)
59	80	463	90 DEG MITRE BEND NB350,R=1.5D	2.12	CS PIPING (1.5.2)

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60	80	463	ASMEB16.9 RED OD323.9X6.35/219.1X6.35	0.02	CS PIPING (1.5.2)
61	80	463	ASMEB16.9 RED OD219.1X6.35/168.3X7.11	0.01	CS PIPING (1.5.2)
62	80	463	ASMEB16.9 RED OD273.1X6.35/219.1X6.35	0.02	CS PIPING (1.5.2)
63	80	463	ASMEB16.9 RED OD273X6.35/88.9X5.49	0.01	CS PIPING (1.5.2)
64	80	463	ASMEB16.9 UEQT OD323.9X6.35/219.1X6.35	0.08	CS PIPING (1.5.2)
65	80	463	ASMEB16.9 BW EQUAL TEE OD273X6.35	0.03	CS PIPING (1.5.2)
66	80	463	ASMEB16.9 UEQT OD273X6.35/88.9X5.49	0.14	CS PIPING (1.5.2)
67	80	463	ASMEB16.9 UEQT OD219.1X6.35/168.3X7.11	0.06	CS PIPING (1.5.2)
68	80	463	ASMEB16.9 UEQT OD219.1X6.35/88.9X5.49	0.04	CS PIPING (1.5.2)
69	80	463	BL. EQT NB50 IS1239 BLACK	0.005	CS PIPING (1.5.2)
70	80	463	BL. UEQT NB50 / 25 IS1239 BLACK	0.01	CS PIPING (1.5.2)
71	80	463	BL. EQT NB25 IS1239 BLACK	0.003	CS PIPING (1.5.2)
72	80	463	RED NB 100/80 IS1239 BLACK	0.01	CS PIPING (1.5.2)
73	80	463	PIPE OD 60.3X3.91 L =2935M EP AT SITE	17.56	SS Piping (1.5.1)
74	80	463	PIPE DIA 88.9X3.05 L=10M EP AT SITE	0.07	SS Piping (1.5.1)
75	80	463	PIPE DIA 33.4X3.38 L=100M EP AT SITE	0.28	SS Piping (1.5.1)
76	80	463	ASMEB16.9 BW EQUAL TEE OD60.3X3.91	0.01	SS Piping (1.5.1)
77	80	463	ASMEB16.9 UEQT OD60.3X3.91/33.4X3.38	0.002	SS Piping (1.5.1)

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78	80	463	ASMEB16.9 BW EQUAL TEE OD33.4X3.38	0.001	SS Piping (1.5.1)
79	80	463	ASMEB16.9 RED OD60.3X3.91/33.4X3.38	0.001	SS Piping (1.5.1)
80	80	463	ASMEB16.9 BWLR 90DEG ELBOW OD60.3X3.91	0.04	SS Piping (1.5.1)
81	80	463	ASMEB16.9 BWLR 90DEG ELBOW OD60.3X3.91	0.004	SS Piping (1.5.1)
82	80	463	ASMEB16.9 BWLR 90DEG ELBOW OD88.9X3.05	0.01	SS Piping (1.5.1)
83	80	463	ASMEB16.9 BWLR 90DEG ELBOW OD33.4X3.38	0.002	SS Piping (1.5.1)
84	80	933	U-ROD CLAMP SS NB50(M8)	0.12	SS Piping (1.5.1)
85	80	933	U-ROD CLAMP SS NB80 (M8)	0.0004	SS Piping (1.5.1)
86	80	933	BL HEXBOLT M8X1.25X30 PCL4.6 GRC IS:1363	0.02	CS PIPING (1.5.2)
87	80	933	BOLT-M12X40 -4.6-IS1363P1	0.03	CS PIPING (1.5.2)
88	80	933	NUT -M 8 -CL4-IS1363P3	0.01	CS PIPING (1.5.2)
89	80	933	NUT -M10 -CL4-IS1363P3	0.02	CS PIPING (1.5.2)
90	80	933	NUT -M12 -CL4-IS1363P3	0.01	CS PIPING (1.5.2)
91	80	933	PUN WASHER-M 8 -IS:2016-A	0.0037	CS PIPING (1.5.2)
92	80	933	PUN WASHER-M10 -IS2016-A	0.02	CS PIPING (1.5.2)
93	80	933	PUN WASHER-M12 -IS2016-A	0.01	CS PIPING (1.5.2)
94	80	933	NON-ASBESTOS JOINTING SHEET 3.0MM	0.03	CS PIPING (1.5.2)
95	80	933	SS SHEET 1.0 -1000X1000	0.01	SS Piping (1.5.1)
96	80	933	C S TUBE CLIP NB 25 (SHORT) IS2062GRB	0.005	CS PIPING (1.5.2)

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97	80	933	C S TUBE CLIP NB 25 (LONG) IS2062GRB	0.02	CS PIPING (1.5.2)
98	80	933	C S TUBE CLIP NB 50 (SHORT) IS2062GRB	0.003	CS PIPING (1.5.2)
99	80	933	C S TUBE CLIP NB 50 (LONG) IS2062GRB	0.01	CS PIPING (1.5.2)
100	80	933	C S ROD TYPE PIPE CLAMP NB 25 IS2062GRB	0.004	CS PIPING (1.5.2)
101	80	933	C S ROD TYPE PIPE CLAMP NB 50 IS2062GRB	0.003	CS PIPING (1.5.2)
102	80	933	C S ROD TYPE PIPE CLAMP NB 80 IS2062GRB	0.24	CS PIPING (1.5.2)
103	80	933	CS ROD TYPE PIPE CLAMP NB 100 IS2062GRB	0.01	CS PIPING (1.5.2)
104	80	933	CS ROD TYPE PIPE CLAMP NB 150 IS2062GRB	0.13	CS PIPING (1.5.2)
105	80	933	CS ROD TYPE PIPE CLAMP NB 200 IS2062GRB	0.16	CS PIPING (1.5.2)
106	80	933	CS ROD TYPE PIPE CLAMP NB 250 IS2062GRB	0.03	CS PIPING (1.5.2)
107	80	933	CS ROD TYPE PIPE CLAMP NB 300 IS2062GRB	0.8	CS PIPING (1.5.2)
108	80	933	BL HEXBOLT M8X1.25X30 PCL4.6 GRC IS:1363	0.001	CS PIPING (1.5.2)
109	80	933	BOLT-M12X40 -4.6-IS1363P1	0.001	CS PIPING (1.5.2)
110	80	933	NUT -M 8 -CL4-IS1363P3	0.001	CS PIPING (1.5.2)
111	80	933	NUT -M10 -CL4-IS1363P3	0.001	CS PIPING (1.5.2)
112	80	933	NUT -M12 -CL4-IS1363P3	0.02	CS PIPING (1.5.2)
113	80	933	NUT -M16 -CL4-IS1363P3	0.01	CS PIPING (1.5.2)
114	80	933	NUT -M20 -CL4-IS1363P3	0.06	CS PIPING (1.5.2)
115	80	933	PUN WASHER-M 8 -IS:2016-A	0.0004	CS PIPING (1.5.2)

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116	80	933	PUN WASHER-M10 -IS2016-A	0.001	CS PIPING (1.5.2)
117	80	933	PUN WASHER-M12 -IS2016-A	0.01	CS PIPING (1.5.2)
118	80	933	PUN WASHER-M16 -IS2016-A	0.002	CS PIPING (1.5.2)
119	80	933	PUN WASHER-M20 -IS2016-A	0.01	CS PIPING (1.5.2)
120	80	933	ANGLE 50X50X6 ASME- SA/IS2062E250A	2.48	Misc. Eqpt./Str steel (1.6)
121	80	933	ANGLE 65X65X6 -ASME- SA/IS2062E250A	4.79	Misc. Eqpt./Str steel (1.6)
122	80	933	CHANNEL 150X75 ASME- SA/IS2062E250A	0.92	Misc. Eqpt./Str steel (1.6)
123	80	933	CHANNEL 100X50 -ASME- SA/IS2062E250A	2.1	Misc. Eqpt./Str steel (1.6)
124	80	933	PLATE 10 MM ASME- SA/IS2062E250A	0.86	Misc. Eqpt./Str steel (1.6)
TOTAL				179.441	CS PIPING (1.5.2)
				18.1104	SS Piping (1.5.1)
				11.15	Misc. Eqpt./Str steel (1.6)
				208.7014	

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Annexure-VII

Weight Schedule of Motors (Bhopal)							
SI No.	Item description	Qty	Unit	Approx. dimen.	Approx unit wt.	Total weight	Category/Sub group
				(L X W X H)			
				(in mtr)	(MT)	(MT)	
1	Booster Fan Motor	8	No.	3.95 x 3.17 x 3.425	10.5	84	ROTATING MACHINE (1.3)
2	RC Pump Motor	12	No.	1.9 x 1.5 x 1	13	156	ROTATING MACHINE (1.3)
3	Wet Ball Mill Motor	2	No.	1.9 x 1.5 x 1	8.1	16.2	ROTATING MACHINE (1.3)
4	Hammer Mill Motor	2	No.	1.9 x 1.5 x 1	2.7	5.4	ROTATING MACHINE (1.3)
TOTAL WEIGHT OF BHOPAL SUPPLIES (MT)						261.6	ROTATING MACHINE (1.3)

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Annexure-VIII

BOQ of the Fire Protection System (BHEL PESD, Hyderabad supply)

Weight Schedule For FGD system (BHEL PE& SD supply for Fire fighting system)			
SL NO.	Item	Weight(In MT)	Category/Sub group
I.	CS Burried Piping	68.2	CS BURRIED PIPING(1.5.3)
II.	CS Piping	16.497	CS PIPING (1.5.2)
III.	Misc. Equipment	37.61	MISC EQUIPMENT /STR STEEL(1.6)
IV	Wrapping and coating of UG pipe (150NB Pipe) (Supply and Application)	1141	Supply and Application of Wrapping Coating Material for underground Burried Piping(1.5.4)
Total		122.31	

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Annexure-IX

Weight Schedule of Trichy Valve				
Valve Description (Size-Class rating-Type-End connection- Operation-Material)	Qty. (Nos.)	Unit Weight (kg)	Total Wt. (kg)	Category/Sub group of Rate Sch.
1/2-C800-SV-SW-HO-A105-SST	120	1.6	192	CS PIPING (1.5.2)
1-C800-SV-SW-HO-A105-SST	23	3.4	78.2	
1/2-C800-SV-SW-HO-F316-SST	4	1.6	6.4	
1-1/2-C800-SV-SW-HO-F316-SST	2	7.3	14.6	
2-C800-SV-SW-HO-F316-SST	2	11.1	22.2	
1-C800-SV-SW-MO-F316-SST	1	69	69	
2-C800-SV-SW-MO-F316-SST	2	72	144	
6-C300-FV-FL-WCB	7	134	938	
6-C300-SV-FL-HO-WCB	1	177	177	
6-C150-GV-FL-HO-WCB	19	76	1444	
8-C150-GV-FL-HO-WCB	4	119	476	
10-C150-GV-FL-HO-WCB	1	202	202	
6-C150-GV-FL-MO-WCB	7	126	882	
8-C150-GV-FL-MO-WCB	7	180	1260	
6-C300-SV-FL-HO-WCB	1	177	177	
4-C300-SV-FL-HO-WCB	1	116	116	
4-C150-GV-FL-HO-WCB	1	61	61	
3-C150-GV-FL-HO-CF8M	1	30.5	30.5	
4-C150-GV-FL-HO-CF8M	1	58.09	58.09	
4-C150-GV-FL-MO-WCB	2	115	230	
3-C300-SV-FL-HO-CF8M	1	76	76	
Total:	208		6653.99	CS PIPING (1.5.2)

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Annexure-X

Weight Schedule for HPEP HYDERABAD				
Item Description	UOM	Total	Total Weight in MT	Category/Sub group
		Qty.		
Rotary Helical Blower with accessories	Nos.	6	34.65	Rotating Machine(1.3)
Helical Blower enclosure	Set	1	1.3	Misc. Eqpnt./Str steel (1.6)
Limestone Day Silo	Set	2	538.92	Misc. Eqpnt./Str steel (1.6)
Limestone Day Storage Silo support Structure (Dim: 23.8x8.9x50 mtr)	Set	2	600.53	Misc. Eqpnt./Str steel (1.6)
RC Pump with accessories	Nos	15	225	Rotating Machine(1.3)
Wet Ball Mill with accessories	Set	2	800	Rotating Machine(1.3)
Total Weight of HYDERABAD Supplies (MT)			1059.65	Rotating Machine(1.3)
			1140.75	Misc. Eqpnt./Str steel (1.6)
			2200.4	

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Annexure-XI
ISG Supplied 1*1250 KVA DG SET

SL NO.	ITEMS	QUANTITY	WEIGHT	REMARKS
1.0	UNLOADING , STORAGE AND SHIFTING OF THE FOLLOWING MATERIALS FROM STORES TO SITE. 1. DG SET 2. ACOUSTIC ENCLOSURE 3.990 LTRS FUEL TANK AND PIPING 4.SILENCERS AND EXHAUST PIPES AND ACCESSORIES 5. EXHAUST SUPPORT STRUCTURE 6.CABLES AND ACCESSORIES 7.CONTROL PANELS, DBs, BATTERY CHARGER, BATTERY 8.CONSUMMABLES - LUBE OIL, COOLANT AND FILTERS 9.SPARES	1 SET	35 TONS	DG SET AND FEW PARTS OF ACOUSTIC ENCLOSURE SHALL BE SUPPLIED IN CONTAINER.
1.1	PLACEMENT OF DG SET ON FOUNDATION	1 SET	15 TONS	DG SET SHALL BE INSTALLED OUTDOORS.
1.2	INSTALLATION/ASSEMBLY OF ACOUSTIC ENCLOSURE	1 SET	4 TONS	
1.3	ERECTION OF SILENCER, EXHAUST PIPING (MS Class 250 NB pipes, CLASS-B), SUPPORT, AND STACK (MS Class 250 NB pipe- CLASS B). INSULATION AND ALUMINIUM CLADDING OF THE ENTIRE STACK UPTO 30 METERS HEIGHT	1 SET	3 TONS	REFER TO DG LAYOUT DRAWING FOR EXHAUST PIPING.
1.4	ERECTION OF EXHAUST SUPPORT STRUCTURE (HEIGHT- 10 MTRS) , lightning arrestor	1 SET	8 TONS	GALVANISED, PRE FABRICATED, BOLTING TYPE EXHAUST SUPPORT STRUCTURE SHALL BE SUPPLIED. SAME TO BE ASSEMBLED AT SITE.
1.5	INSTALLATION OF DG AMF PANEL, DISTRIBUTION BOARD, BATTERY CHARGER AND BATTERY ON DG FOUNDATION , INSIDE THE ACOUSTIC ENCLOSURE.	1 SET	1.5 TONS	
1.6	INSULATION AND ALUMINIUM CLADDING OF SILENCER, EXHAUST PIPING AND STACK	1 SET	0.5 TONS	
1.7	ERECTION OF FUEL TANK AND FUEL PIPING (MS Class 1 inch Pipes). FLUSHING OF TANKS AND FUEL LINES AT THE TIME OF COMMISSIONING. PAINTING OF FUEL LINES. FILLING OF 1000 LTRS OF HIGH SPEED DIESEL DURING COMMISSIONING.	1 SET	0.5 TON	*REFER TO DG LAYOUT DRAWING AND P&ID OF FUEL TANK FOR REFERENCE.
1.8	DRAINING AND FILLING OF LUBE OIL AND COOLANT IN THE ENGINE AT THE TIME OF COMMISSIONING.	1 SET	150 LITRES LUBE OIL AND 300 LITRES COOLANT.	
1.9	INSTALLATION OF TERMINAL BOX, PROTECTION CTs AND TERMINATIONS OF POWER CABLES.	1 SET	0.2 TONS	

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Annexure-XII BILLING SCHEDULE)

1. 85% PRO RATA PAYMENTS as per the Unit Rate (Applicable for ITEM No: 1.1, 1.2, 1.3, 1.4, 1.5.1, 1.5.2, 1.5.3 & 1.6 of Price Schedule.)

Sl No	Activity	For item No: 1.1 (Str. & Duct / Dampers)	For item No: 1.2 (Tanks)	For item No: 1.3 (Rotating Machines)	For item No: 1.4 (Insulation)	For item No: 1.5.1, 1.5.2, & 1.5.3 (Piping)	For item No: 1.6 (Misc Equipment / Strl Steel)
1	Completion of Preassembly, (if not applicable this portion shall be clubbed with Placement in position)	20%	20%	20%		20%	20%
2	Placement in position	25%	20%	20%	50%	20%	25%
3	Alignment	20%	10%	20%		10%	20%
4	Welding/Bolting/Fixing as required.	15%	20%	20%	35%	15%	15%
5	Completion of Non Destructive Examination & Stress relieving /heat treatment, (if not applicable, then this portion to be paid along with welding)	5%	10%	5%		10%	5%
6	H&S wherever applicable as per drawing					5%	
7	Hydro Test of Piping/Water Fill Test/ Vacuum Box test of Tanks/Holiday test (as applicable)		5%			5%	
	TOTAL FOR PRORATA PAYMENTS	85%	85%	85%	85%	85%	85%

2. 85% PRO RATA PAYMENTS of Unit Rate (Applicable for ITEM No: 1.5.4 of Price Schedule.)

Sl No	Activity	For item No: 1.5.4 (Wrapping & Coating Material Supply & Application for Underground buried pipe)
1	Supply of Wrapping & Coating Material	50%
2	Application	25%
3	Non destructive examination (Holiday Test)	5%
4	Hydro Test	5%

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3. STAGE/ MILESTONE PAYMENTS (15%) (Applicable for ITEM No: 1.1, 1.2, 1.3, 1.4, 1.5.1, 1.5.2, 1.5.3,1.5.4 & 1.6 of Price Schedule.)

Further 15 % payment on pro-rata basis common to all groups shall be released on achievement of the following stage / milestones events (as per no 1 to 11 of the following table) for the quantity erected

SI No	Activity	Milestone Payment	
1	Completion of air & Gas tightness test for Ducts	4 X 0.5%	2.0%
2	Completion of Trial Run of Slurry Pumps	--	1.0%
3	Trial Run of Wet Ball Mills	4 X 0.5%	2.0%
4	Trial Run of Booster Fans	8 X 0.125%	1.0%
5	Trial Run of Oxidation Blower	8 X 0.125%	1.0%
6	Trial Run of FGD System	4 X 0.5%	2.0%
7	Completion of Painting	--	2.0%
8	Area Cleaning, Temporary Structures Cutting/Removal and return of Scrap	--	1.0%
9	Liquidation of Pending Points	--	1.0%
10	Material Reconciliation	--	1.0%
11	Completion of all Contractual Obligation and demobilization of site office.	--	1.0%
	TOTAL		15%

4. Contractor supplied items that go as permanent part of the system: Progressive payment/final payment (Part A2 of Price Schedule):

The payments for works under the scope of this contract shall be as per Price Schedule.

5. Payment towards installation and commissioning of DG set shall be done as follows (Price Schedule – 1.7)

SI No	Description of activity	% payment
1	Preparation of foundation, erection, placement in position, leveling, grouting, and completion etc of DG set, Fuel day tank, exhaust support structure.	45%
2	Internal fuel oil piping and complete exhaust piping completion	25%
3	Alignment of Engine with Generator, Completion of erection, welding of accessories viz. Pipes, Structural, cable laying, connections/ terminations, pre-commissioning tests	20%
4	Testing, trial run and commissioning of DG Set.	10%
	TOTAL	100

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6. Payment towards works of Tap-off duct work shall be done as per follows (Price Schedule – 1.8)

SI No	Description of activity	% payment
1	Removal of Insulation (Cladding sheet & Insulation wool) at three locations per Unit to facilitate for cutting & removal of existing duct for erection of bypass damper (1 location) & tap off ducts (2 locations). Cutting & removal of portion of existing duct.	35%
2	Erection of tap off ducts, gates and dampers	50%
3	Shifting of removed Insulation materials & removed duct plates from erection site to BHEL/Customer yard.	15%
	TOTAL	100

7. Payment towards PG Test assistance (Price Schedule – 1.9)

100% Payment on completion of the PG test of each unit which is to be certified by the BHEL