

Spec No. MED/5KLD/01
 Dated: 21/05/20

BHARAT HEAVY ELECTRICALS LIMITED					ENQUIRY NO.
UNIT'S ADDRESS :					DUE DATE
CONTACT PERSON'S NAME / DESIGN./ PHONE NO./ E-MAIL (FROM PURCHASE DEPARTMENT)					SUPPLIER QTN. NO.
					REV. NO. 01
					REV. DATE 21.05.20

TECHNICAL SPECIFICATION FOR EFFLUENT TREATMENT PLANT OF 5 KLD FOR BIO MEDICAL WASTE FOR PATHOLOGY CENTRE AT KASTURBA HOSPITAL

NOTE :-	
NAME & ADDRESS OF THE SUPPLIER :	
TELEPHONE NOS :	
FAX NOS.	
E-MAIL ADDRESS :	

NAME & ADDRESS OF THE INDIAN AGENT :

TELEPHONE NOS.

FAX NOS.

E-MAIL ADDRESS

S. No.	SCOPE OF WORK / SUPPLY	SPECIFIED / TO BE CONFIRMED BY VENDOR	OFFERED	DEVIATION	REMARKS
1	GENERAL				
1.1	Design, engineering, procurement of material, assembly, inspection, supply, shipment to site, erection and commissioning for Treatment of bio medical waste water.	Vendor to note and confirm			
2	CAPACITY				
2.1	5,000 Litres per day	Vendor to confirm			
2.2	Effluent TYPE (BMW)	Vendor to Note			
2.2.1	Bio medical waste from Pathology Centre	Vendor to note			
2.2.2	Mode : Auto and Manual both	Vendor to confirm			
2.3	FINAL WATER CHARACTERISTICS				
	The effluent water will be collected in a RCC pit of 5000 ltrs and shall be treated. After treatment the impurities accumulated shall be disposed and final clean water will be discharged for other use.	Vendor to note			
2.3.1	EFFLUENT WATER CHARACTERISTICS				
	pH: 6-8.5	Vendor to confirm			
	Suspended solids < 200 mg/L	Vendor to confirm			
	Oil & grease < 40 mg/L	Vendor to confirm			
	COD 400 mg/L	Vendor to confirm			
	BOD (3 days/27°C) < 50 mg/L	Vendor to confirm			
2.3.2	FINAL DISCHARGE WATER CHARACTERISTICS				
	pH: 6.5-7.5	Vendor to confirm			
	Suspended solids < 50 mg/L	Vendor to confirm			

Signature: *[Signature]*
 Date: 21/05/20
 Per: *[Signature]*
 For: *[Signature]*

	Oil & grease < 10 mg/L		Vendor to confirm		
	COD 250 mg/L		Vendor to confirm		
	BOD (3 days/27°C) < 20 mg/L		Vendor to confirm		
3	SCOPE OF SUPPLY				
3.1	PROCESS DESCRIPTION				
3.1.1	All dosing is to be done using metering pumps from stirred dosing tanks of suitable size. pH meters will be provided wherever required and dosing for pH control shall be operable in both automatic and manual level switch required.	Vendor to confirm			
3.1.2	From neutralizer, the effluent shall gravity flow to a lamella clarifier for settling of the sludge. The water from the clarifier shall overflow to the buffer tank. From buffer tank the water shall be pumped either back to pits or overhead tank. Equipment will provide for both arrangements.	Vendor to confirm			
3.1.3	The bottoms stream from clarifier shall be dewatered in a hydraulic filter press. The water from the press shall be recycled back to the clarifier. Dewatered sludge shall be hauled away manually	Vendor to confirm			
3.2	EQUIPMENT, MATERIAL and PLANT				
3.2.1	Scope of supply shall include, but not necessarily be limited to following. Any additional equipment required to achieve treated water quality shall be included by the vendor in their scope of supply and vendor shall mention the details of the same in the bid document.	Vendor to note and confirm			
3.2.2	Aeration Tank Size :	Vendor to specify			
3.3.3	Aeration Tank Material : SS	Vendor to confirm			
3.3.4	Air Blowers (Everest / Kay / KPT) the capacity of all the blowers to be suitably designed for 5 KL effluent / day	Vendor to specify and confirm			
3.3.5	Sludge transfer Pumps 2 Nos (Kirlskar / Kishor / Aqua) the capacity of all the pumps to be suitably designed to pump 5 KL effluent / day - level switch - 02 nos. required.	Vendor to specify and confirm			
3.3.6	Filer feed pumps 2 Nos (Kirlskar / Kishor / Aqua) the capacity of all the pumps to be suitably designed to pump 5 KL effluent / day - level switch required.	Vendor to specify and confirm			
3.3.7	Filters (SVK) , Auto MPV required	Vendor to confirm			
3.3.8	Ozonator with level switch required	Vendor to specify and confirm			
3.3.9	Piping and valves required within the battery limit	Vendor to specify and confirm			
3.4	Electricals				
3.4.1	Controls, sequencing and safe guarding of the complete plant shall be within vendor's scope. Vendor shall furnish the details.	Vendor to confirm and submit			
3.4.2	Motor Control, Local Control Panel, cables within the battery limit and termination in the control panel / MCC located in safe area near the ETP.	Vendor to specify & confirm			
3.4.3	All instruments shall be visible from grade level otherwise platform shall be provided	Vendor to specify & confirm			

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3.4.4	For automatic, level switch of CT, DT, immediate tank & treated water tank, Auto MPV at filters required. 415V +/- 10% 50HZ +/- 3 %, 3 Phase AC (3 wire system without neutral) Power Supply will be provided by BHEL at a single point near the plant, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the plant/control cabinets, shall be the responsibility of vendor. Requirement of grounding/earthing with required material details should be informed by vendor well in advance so that same could be incorporated during construction of foundation.	Vendor to specify & confirm			
3.4.5	Vendor shall ensure that supplied instruments and electrical components are suitable for the area classification as per IS: 5572, Zone 1, Gas Group IIA/IIB	Vendor to confirm			
3.4.6	Tropicalisation: All electrical / electronic equipment shall be Tropicalized	Vendor to confirm			
3.4.6	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm			
3.4.7	All electrical including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts, 5 Amp.	Vendor to confirm			
3.4.8	Motors shall conform to IEC or Indian Standards	Vendor to confirm			
3.4.10	All cables outside the electrical cabinets and operator pendant must be routed through flexible conduits capable of withstanding stress, chip hazard and ingress of oil/coolant. Additionally, all cables moving with traversing axes should be of trailing type and installed in caterpillar / cable drag chain.	Vendor to specify & confirm			
3.4.11	Vendor should ensure the proper earthing for the plant machinery and its peripherals.	Vendor to confirm			
3.5	SAFETY ARRANGEMENTS:				
3.5.1	Following safety features in addition to other standard safety features should be provided on the plant machinery:				
3.5.2	There should be adequate and reliable safety interlocks / devices to avoid damage to the plant and the operator due to the malfunctioning or mistakes. Plant functions should be continuously monitored and alarm / warning indications through light indication/ hooter with messages (on suitable annunciation / display panels) should be available. Necessary guard and protection covers should be provided wherever necessary	Vendor to specify & confirm			
3.5.3	All the pipes, cables etc. in the plant should be well supported and protected. These should not create any hindrance to plant operator's / employee movement for effective use of the plant.	Vendor to specify & confirm			
3.5.6	All the rotating parts used in the plant should be statically & dynamically balanced to avoid undue vibrations.	Vendor to specify & confirm			
3.5.7	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to specify & confirm			
3.5.8	Oil & water pipe lines should not run with electrical cable in the same tray / trench.	Vendor to specify & confirm			
3.5.9	Other equipment and Material				
3.5.10	Mechanical kit comprising bracketries, fasteners etc.	Vendor to specify & confirm			
3.5.11	Electrical kit comprising cables, conduits, covered cable trays, glands, ferrules, lugs etc.	Vendor to specify & confirm			
3.5.12	Lifting and earthing lugs for packaged units, vessels and pump sets	Vendor to specify & confirm			

3.5.13	First fill of lubricants to be supplied separately along with the pump sets	Vendor to specify & confirm			
3.5.14	Dosing chemicals, detaching chemicals etc required for satisfactory operation of the plant for 6 months operation	Vendor to specify & confirm			
3.5.15	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc should be supplied	Vendor to specify & confirm			
3.5.16	Special tools and equipment required for erection of the plant shall be brought by the vendor. All necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the plant should be supplied. List of such tools should be submitted with offer	Vendor to submit			
3.5.17	Any special tools required for maintenance and repair should be indicated and quoted separately with item wise price details	Vendor to submit			
3.5.18	All documents as specified in this document	Vendor to confirm			
4	APPLICABLE CODES, SPECIFICATIONS & STANDARDS				
4.1	Construction of unfired Pressure vessels: ASME Section VIII Div. I	Vendor to confirm			
4.2	Pipe flanges and flanged fittings: ASME B 16.5 (2003)	Vendor to confirm			
4.3	Technical Specification for Centrifugal Pumps Class II: ISO 5199	Vendor to confirm			
5	ENVIRONMENTAL PERFORMANCE OF THE PLANT :				
	The Plant should conform to following factors related to environment :				
	a) Maximum noise level shall be 85 dB(A) under normal working conditions, 1 meter away from any noise generating plant machinery with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliance to noise level, if asked for.	Vendor to confirm			
	b) If any safety / environmental protection enclosure is required it should be built in the plant by the vendor.	Vendor to Confirm			
	c) Final discharge water characteristics to be tested from MPCCB Lab for third party verification and performance of the plant. Vendor to get the certification from MPCCB	Vendor to confirm			
6	SPARES : (Optional - to be quoted separately)				
6.1	Itemised breakup of mechanical, hydraulic, electrical and electronic spares used in the plant as per recommendation of Vendor should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered) Note : The price of the spares will not be considered for the evaluation of the plant cost (L1 criteria)	Vendor to offer			
6.2	a) Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc.	Vendor to offer			
6.3	b) Electrical / Electronic Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch etc.	Vendor to offer			
6.4	All types of spares for total plant and accessories should be available for atleast ten years after supply of the plant. If any constituent machinery or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to submit			

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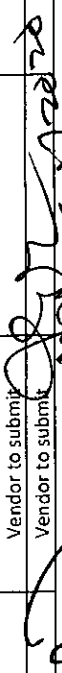
6.5	Vendor to confirm that complete list of spares for plant and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the plant	Vendor to submit			
7	DOCUMENTATION :				
7.1	Four sets of Hard Copies (Print form) of the following documents in English language should be supplied along with the plant				
7.1.1	Test and guarantee certificates	Vendor to submit			
7.1.2	Operating manual of plant system	Vendor to submit			
7.1.3	Detailed Maintenance manual of all plant machinery with all drawings of plant assemblies/sub-assemblies/parts. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also.	Vendor to submit			
7.1.4	Manufacturing drawings for all supplied tanks, pumps, shafts, blades etc.	Vendor to submit			
7.1.5	Catalogues, O&M Manuals of all accessories and bought out items including drawings and schematics wherever applicable.	Vendor to submit			
7.1.6	Detailed Electrical Schematics including complete wiring no. & cross reference of the plant with comments in English.	Vendor to submit			
7.1.7	Complete Master List of parts used in the plant shall be submitted by the vendor.	Vendor to submit			
7.2	Documents/information to be supplied after award of contract Vendor shall furnish all technical documents and provide such other services, including coordinating with/making presentation etc. required for approval by statutory authorities and Pollution Control Board etc.	Vendor to submit			
8	TRAINING				
8.1	BHEL Persons shall be trained by vendor for mutually agreed period in the operation and maintenance of plant and all supplied sub-systems.	Vendor to Confirm			
8.2	Vendor to quote for training on per man per week basis	Vendor to offer			
9	FOUNDATION :				
9.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) / P.O. Soil condition data will be furnished by BHEL along with the approval. Complete Foundation Design including details viz. static / dynamic load details etc. and Final Layout drawings shall be submitted by the supplier within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete plant including space requirement & any other accessories. BHEL shall construct complete foundation for the plant under supervision of supplier and at supplier's responsibility. Vendor should arrange equipments required for the testing of foundation, if required by the vendor. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the plant equipment.	Vendor to submit			
10	ERECTION & COMMISSIONING				

10.1	Supplier to take full responsibility for carrying out the erection, start up, testing of plant, it's control & all types of other supplied equipment, treatment of test load etc. Service requirement like power, oil & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. Other requirements like crane and helping personnel shall be responsibility of supplier. Details of these requirements should be informed by vendor in advance.	Vendor to confirm			
10.2		Vendor to confirm			
10.3	Commissioning spares, required for commissioning of the plant within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm			
10.4	Portion, if any, of the plant, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	Vendor to confirm			
10.5	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to submit			
10.6	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to specify			
10.7	Duration of erection and commissioning	Vendor to specify			
11	PACKING:				
11.1	Road worthy & rigid packing for all items of complete plant equipment, all Accessories and other supplied items to avoid any damage/loss in transit. When plant components are despatched in containers, all small loose items shall be suitably packed in boxes. Packing list will be sent along with material	Vendor to confirm			
12	GUARANTEE :				
12.1	Unless otherwise agreed, all equipment shall be guaranteed as follows: All equipment shall perform satisfactorily under the operating conditions and provide treated water quality as per this specification and shall be fit for the purpose intended.	Vendor to confirm			
12.2	The vendor shall guarantee				
12.2.1	Sustained operation at the conditions outlined in this specification and relevant documents	Vendor to confirm			
12.2.2	Consumption of utilities like water, chemicals and electrical power is as per design parameters	Vendor to confirm			
12.2.3	The mechanical and structural integrity, workmanship and the material of construction used	Vendor to confirm			
12.2.4	Plant and all its constituent equipment and accessories shall be guaranteed for up to 24 months from the date of acceptance	Vendor to confirm			
13	PLANT ACCEPTANCE: (Tests/Activities to be Performed by Vendor)				
13.1	The responsibility for inspection, certification etc., of all materials, parts lies with the vendor	Vendor to confirm			
13.2	BHEL has the right to request additional inspection or tests to ensure that the equipment complies with this specification and all relevant codes and standards. The cost for such additional testing shall be borne by vendor	Vendor to confirm			

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13.3	All equipment shall be presented for inspection in an unpainted state except for final inspection. All instruments and other equipment necessary for testing shall be supplied by vendor	Vendor to confirm			
13.4	Mill and shop inspection shall not relieve vendor from his contractual responsibility for replacing any defective material and for repairing any defective workmanship that may be discovered in the field	Vendor to confirm			
13.5	The vendor shall send inspection notification atleast 2 weeks in advance and shall send a minimum of 15 working days notice prior to carrying out Factory Acceptance Test	Vendor to confirm			
13.6	Tests/Activities to be carried out at supplier's works on the plant equipment before dispatch in presence of BHEL inspectors:				
13.6.1	Demonstration of all features of the plant, control system & accessories	Vendor to confirm			
13.6.2	Visual inspection of all tanks, pumps etc and other accessories	Vendor to confirm			
13.6.3	Spark testing of rubber lined vessels	Vendor to confirm			
13.6.4	Such other tests, as required, to ensure compliance of equipment with standards as mentioned in cl 4.0 and provisions of the Factories Act, 1948	Vendor to confirm			
13.7	Tests/Activities to be carried out at BHEL works while commissioning the machine :				
13.7.1	Supplier shall demonstrate and successfully treat/recycle BHEL paint booth waste water.	Vendor to confirm			
13.7.2	The plant shall be tested for continuous running of 8 hrs. If any break down occurs during this test, the test should be repeated for 8 hrs from that time.	Vendor to confirm			
13.7.3	Demonstration of all features of the plant, control system & accessories to the satisfaction of BHEL for efficient and effective use of the plant	Vendor to confirm			
13.7.4	Demonstration by actual use of all supplied accessories.	Vendor to confirm			
13.7.5	Four weeks supervision of independent operation of plant by BHEL	Vendor to confirm			
13.7.6	Training of BHEL operators in operation of complete plant & accessories etc by the supplier's experts / engineers during their stay at BHEL works	Vendor to confirm			
14	REFERENCE LIST / QUALIFYING CONDITIONS :				
14.1	Only those vendors (OEM) or their authorized agents, who have supplied and commissioned at least one plant of same (4 KLD) or higher capacity for similar (any Bio Medical Waste Water) treatment applications in the past 4 years (on the date of opening of Tender) and such plant is presently working satisfactorily for more than two years after commissioning (on the date of opening of Tender), should quote. For startups & Micro and Small vendors experience criteria will remain same.	Vendor to note			
14.2	The following information should be submitted by the vendor about the companies where similar plants have been supplied. This is required from all the vendors for qualification of their offer.				
14.2.1	Name of the customer / company where similar plant is installed along with copy of customer's purchase order	Vendor to submit			
14.2.2	Complete postal address of the customer.	Vendor to submit			
14.2.3	Month & Year of commissioning.	Vendor to specify			
14.2.4	Application for which the plant is supplied and parameters of waste water being controlled	Vendor to specify			
14.2.5	Name and designation of the contact person of the customer.	Vendor to submit			
14.2.6	Phone, FAX no. and email address of the contact person of the customer.	Vendor to submit			


 Name and designation of the contact person of the customer.

Phone, FAX no. and email address of the contact person of the customer.

14.2.7	Performance certificate from at least one customer regarding satisfactory performance of equipment supplied to them consonant with the requirements of clause 14.1	Vendor to submit			
14.2.8	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false/incorrect, the offer shall be rejected.	Vendor to confirm			
14.2.9	(A) Bidder Should have an average Turnover of Rs 8 lakhs or more for last 3 consecutive financial years ending march 2019 & it should be supported by Annual report (Balance Sheet and Profit & Loss Account). In case of Foreign bidders, business information report issued by D & B / Experian etc to be submitted along with offer.	Vendor to confirm			
	(B) For Startups & Micro Small vendors (both for Manufacturers and Traders) exemptions are provided from the condition in 14.2.9 (A) ✓				
15	BHEL's Scope				
15.1	BHEL will provide the incoming RCC tank of 5000 Ltrs and Platform as civil drawing provided by the Supplier.	Vendor to note			
15.2	One point 3 phase 415V AC will be provided by BHEL for electrical supply. All the other accessories like stepdown transformer if required will be of Vendor's scope.	Vendor to Confirm			
15.3	All the lifting and transportation equipment will be of Vendor's scope	Vendor to Confirm			