

**MINISTRY OF HEALTH & FAMILY WELFARE,
GOVT. OF INDIA, NEW DELHI
(Department of AYUSH)**

Tender

For

Design, Supply, Installation, Testing & Commissioning of Sewage Treatment Plant (STP) and Effluent Treatment Plant (ETP) including Civil and other associated works in the existing All India Institute of Ayurveda Campus for Deptt of AYUSH at Sarita Vihar, New Delhi

Volume-V

BILL OF QUANTITIES

OCTOBER '2013



**HSCC (INDIA) LTD.
(CONSULTANTS & ENGINEERS FOR MEGA HOSPITALS & LABORATORIES)
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Tender No. HSCC/AIIA/STP/2013

ABSTRACT

**Name of Work: Construction of proposed STP (215 KLD) and ETP(11 KLD)
for AIIA at Ayush Sarita Vihar, New Delhi.**

S.No.	Description	Amount in figures(in Rs.)
1.00	Sewage Treatment Plant (STP)	
2.00	Operation and maintance Cost	
3.00	Effluent Treatment Plant(ETP)	
	TOTAL	

Name of Work: Construction of proposed STP (215 KLD) and ETP(11 KLD) for AIIA at Ayush Sarita Vihar, New Delhi.						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in words(in Rupees)	Rate in figures(in Rs.)	Amount in figures(in Rs.)
1	2	3	4	5	6	7
1.00	SEWAGE TREATMENT PLANT (STP)					
	Planning,Designing,Detailing,Supplying, Erection,Testing and Commissioning of Package Sewage treatment plant based on MBBR (Moving bed Bio Reactor)/FAB technology of average flow rate of 215cu.m/day for sewer including provision of recirculation of treated sewage/effluent for the use of horticulture/flushing/A/c purposes including design and execution of all civil,structural,electrical,mechanical, plumbing and processing,ancillary equipments and works etc required to complete the package, getting approval from state pollution control board and other statutory bodies as well as from consultant (consultant) /Client including the cost of STP building for electrical room, treated sewage under ground storage tank of 100 cu.m capacity etc.					
	All the water retaining structure shall be designed as water retaining structure as per provision of IS code and water proofing with fixed or any other approved chemical shall be carried out by approved agency with 10 year (minimum) garanty. All the unit shall be painted by epoxy or fixed with the white glazed tiles of approved make. The civil works of entair STP will be carried out by agency as per drawings prepared by STP E&M agency.					
i)	The shop drawings & design of STP shall be prepared by the agency . As per site condition/available space most of the unit will be placed below ground under road/green area/ as per site condition and equipment and pump room will be above the ground level as per approved drawings .The STP shall be comprising of the following units of required size as per detail process and hydraulic design.The structure design shall be carried as per provision of IS code.The agency has to get their structure drawing checked and approved by any govt. Engineering college approved by consultant.	Set	1.0			

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1	2	3	4	5	6	7
ii)	RCC Suitable size Bar Screen chamber with minimum free board 300 mm and minimum size 1.5mx0.8mx0.3m SWD and suitable size SS Bar screen with minimum size of bar 5x25 mm is installed at suitable angle at the inlet of raw sewage sump before pumping and manual system to collect and transport the screening material . The unit shall be designed for peak flow , and one no. SS slotted fine screen 2 mm thick after bar screen to be fixed in chamber itself.					
a)	Complete Bar Screen and SS slotted fine screen Electrical & mechanical Works , excluding civil works	Set	1.0			
iii)	RCC Oil & Grease trap with mechanical oil and grease removal arrangement at one end of the chamber operated at a fixed interval.	Set	1.0			
iv)	Supply, installing, testing and commissioning vertical fully floodable type submersible drainage pump of non-corrosive material with shredder/cutter in close coupled design single stage, suitable for handling 30-50 mm dia solids for transferring raw sewer from sump to outside the building with float switch for automatic start and stop arrangement with panel and wiring, chain and pulley, mechanical seal complete in all respect as per instruction of the Engineer in charge. (The shop drawing or the pumps along with its characteristics curves, model and technical data etc. are to be submitted for approval before purchase of pump).Star delta suitable starter complete in all respect for automatic/manual operation of pump,start and stop push button contactor with required overload production and single phase preventor.					
	Material of Construction (M.O.C): Corrosion Resistant in general : Casing — Cast Iron					
	: Impeller — Ductile cast iron/SS					
	: Bearings — Anti friction, prelubricated ball bearings, packed with grease for life.					
	Motor: — Dry Motor with built in over load protection					
	Protection - IP68.					
	Insulation Class - F					

SI. No.	Description of Item	Unit	Total Qty.	Rate in words(in Rupees)	Rate in figures(in Rs.)	Amount in figures(in Rs.)
1	2	3	4	5	6	7
	RAW SEWAGE PUMP					
	Capacity -180LPM (min.)					
	Head - 12 m					
	Solid handing - 30-50mm					
a)	RAW SEWAGE PUMP Electrical & mechanical Works , excluding civil works	Set	2.0			
b)	Drainage Sump Pump-150LPM & 10 M head	Set	2.0			
v)	RCC Equalisation tank with hydraulic retention time Min.4 Hrs HRT of STP designing Average flow with suitable Size free Board 500 mm,the effluent of equalisation tank is agitated with diffused air that is fed by an air blower, including pipe non-corrosive material and its complete system.					
a)	Equalisation tank Electrical & mechanical Works , excluding civil works	Set	1.0			
vi)	RCC Moving bed Bio Reactor (MBBR-2nos. minimum) with minimum 5hr. retention time of STP designing Average flow rate for each reactor of suitable size with Air grid CPVC/Gi pipe material of construction or corrosion resistant material,Air diffusers (fine bubble), HDPE approved make Bio media for each aeration tank,with minimum water depth of 3.8 m.					
a)	Moving bed Bio Reactor - Electrical & mechanical Works , excluding civil works	Set	2.0			
vii)	ROTARY AIR BLOWERS					
	Providing and Installation of Rotary air blowers for air scouring, driver through v-belt or directly coupled through flaxble coupling. Motor shall be of suitable HP for 400-440 volts, ,1500RPM, 3 phase, alongwith air filter, non-return valve, safetyvalve, base plate and necessary air piping fittings, valves, flowmeters etc.					
	(Blower capacity and pressure head shall be suitable to meet the requirement of equalisation tank and Bio reactor suitable for average flow rate of sewer of 11 cu.m per hr.)- 3 nos.(2working +1 stand by)					
a)	ROTARY AIR BLOWERS - Electrical & mechanical Works , excluding civil works	Set	3.0			

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1	2	3	4	5	6	7
viii)	RCC secondary tube settler/Lamella Clarifier -1 no. maximum Hydraulic loading 1.75 cu.m/sq.m/hr /1.5 cu.m/sq.m./hr. respectively and with approved quality media with minimum water depth of 2.4 m.+ Free board & hopper bottom. The lamina clarifier media shall be of acarlac plate min. 10 mm thick					
a)	Tube settler - Electrical & mechanical Works , excluding civil works	Set	1.0			
ix)	Providing and fixing of Oxilyte (Mixed Oxidant) Generation System, based on ECA Technology, producing non toxic mixed Oxidant Slution at 1000 ppm of Oxidant Concentration or any other approved disinfection method excepted by consultant. The solution should be at a pH 3+-0.5 suitable for 24x7 operations should produce 100litre per hour. The system should be supplied complete with appropriate dosing pumps , valves, piping, fittings, chemical dosing tank etc. complete in all respect.					
a)	Oxilyte (Mixed Oxidant) Generation System - Electrical & mechanical Works , excluding civil works	Set	1.0			
x)	RCC supernatant tank/Filter feed tank minimum 40cu.m capacity (1 unit) with following filter feed pumps -					
	FILTER FEED PUMPSETS					
	Providing and installation horizontal single/multistage centrifugal monoblock pumping set with CI body, SS impeller, coupled with totally enclosed fan cooled inlduction motor mounted on common structural base plate with all pump accessories complete as per specifications inclusive rubber vibration eleminators motor suitable for 415 volts, 1500RPM, 3 phase 50 HZ. A/c supply.					
	Type of pump - Horizontal					
	Capacity -300LPM					
	Head - 30 M					
	Nos. - 2 (min.) - nos.(1working +1 stand by) as one set					
a)	Filter feed tank & Pumps - Electrical & mechanical Works , excluding civil works	Set	1.0			
xi)	MULTI GRADE FILTER					

SI. No.	Description of Item	Unit	Total Qty.	Rate in words(in Rupees)	Rate in figures(in Rs.)	Amount in figures(in Rs.)
1	2	3	4	5	6	7
	Providing and installation of mild steel pressure vessel (as per IS:2825) 6 mm thick natural rubber lining fabrication standard multi grade filter complete in all respects, with dished ends, supporting legs, manhole cover, frontal pipe work fitting with valves. Plant shall be provided with inlet, outlet pressure gauge, sample cocks, charge of filter media graded sand and internals consisting of strainers fitted on plate for collection. (No. of unit-1)					
	Dia of vessel -1000mm (minimum)& 1.8 m height					
	Shell thickness -6mm (minimum.)					
	Filtration rate - 20,000 lph/sqm (min.) &					
	Dish end thickness-8mm (minimum.)					
	Nozzie plate -10mm thick (minimum.)					
	Manhole -450mm					
	Total capacity -300LPM, complete					
a)	MULTI GRADE FILTER - Electrical & mechanical Works , excluding civil works	Set	1.0			
xii)	ACTIVATED CARBON FILTER					
	Providing and installation of mild steel pressure vessel (as per IS:2825) 6 mm thick natural rubber lining fabrication standard multi grade filter complete in all respects, with dished ends, supporting legs, manhole cover, frontal pipe work fitting with valves. Plant shall be provided with inlet, outlet pressure gauge, sample cocks, charge of approved quality activated carbon media. (No. of unit-1)					
	Dia of vessel -1000mm (minimum)& 1.8 m ht.					
	Shell thickness -6mm (minimum.)					
	Dish end thickness-8mm (minimum.)					
	Nozzie plate -10mm thick (minimum.)					
	Manhole -450mm					
	capacity -300LPM,					
a)	ACTIVATED CARBON FILTER - Electrical & mechanical Works , excluding civil works	Set	1.0			

SI. No.	Description of Item	Unit	Total Qty.	Rate in words(in Rupees)	Rate in figures(in Rs.)	Amount in figures(in Rs.)
1	2	3	4	5	6	7
xiii)	RCC sludge sump (30 cu.m minimum) and sludge pump set with CI body, SS impeller and shaft coupled with to a totally enclosed fan cooled iniduction motor complete with HDPED/F pipings, sluice valves, non return valves, fittings etc as required. Motor suitable for 415 volts, 3 phase 50Hz. A/c supply with control auto start float switch with return sludge line upto Bioreactor.					
	SLUDGE PUMP- (2 nos.)					
	Capacity -100 LPM(minimum)					
	Head - 8 m					
	Solid handling - 30mm (minimum)					
a)	sludge sump & Pump - Electrical & mechanical Works , excluding civil works	Set	1.0			
xiv)	Providing and fixing 24 plates 600 x 600mm size filter press - . with suitable sludge pump(screw type) alongwith piping, fittings valve etc. complete in all respects.					
a)	Filter press & sludge pump(screw type) - Electrical & mechanical Works , excluding civil works	Set	1.0			
xv)	Providing and fixing dust and vermine proof cubical type motor control panel centre for the various pumps, blower etc. required. It is fabricated from 2mm thick CRCA sheet with stove enamelled finish and comprising of:Panel should have at least 20% spare feeders.					
a.	One incomming main MCCB of required capacity suitable rating					
b.	MCCB/MPCB, one for each motor					
c.	Fully automatic DOL/star delta starters suitable for different motors/pumps used in the ETP.Upto 7.5 HP DOL may be used and above star/delta starter used with push buttons one for each motor and on/off indicating neon lamps.					
d.	Single phasing preventors of appropriate rating for each motor.					
e	rotary type selector switch					
f	Panel type ampere meters, one for each motor shall be with rotary selector switch to monitor line currents.					
g	Panel type volt meters, on incoming main with rotary selecting switch to monitor voltage between phase to neutral and phase to phase.					

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1	2	3	4	5	6	7
h	Neon phase indicating lamps and indicating lamp for each motor on incoming mains.					
l	Rotary switch for manual or auto operation for each pump					
j	Fully taped separate aluminium bus bar of required capacity for normal and emergency supply.					
k	The panel shall be pre-wired with coded wiring. All intercnnting wiring from incoming main to switchgear, meters and accessories within the switchboard panel shall have suitable copper ferrules					
xvi)	Electrical works (including supply, installation and termination of cables of suitable size as per HP of all pumps with all structural supports, clamps and cable trays as per approved design/specifications,installation will be as per relevant Indian standard and CPWD specification alongwith control cable of suitable size).(1 lot). Any other electrical and mechanical item required to complete the work.	Set	1.0			
xvii).	Providing and fixing digital type flow meter etc. complete in all respects. (1 no.)	Set	1.0			
xviii)	Providing and fixing lab. Equipments including digital type pH meter, COD kit, TDS kit, bicker, conical flask etc. complete in all respects. (1 set)	Set	1.0			
xix)	Sludge drying beds (4.0X2.0.0X1.0) (minimum size)-2 nos. - Electrical & mechanical Works , excluding civil works	Set	1.0			
xx)	Rooms for Pumps & control panel (100 sq.m.) (minimum size) - Electrical & mechanical Works , Ventillation fan and lighting etc., excluding civil works.	Set	1.0			

SI. No.	Description of Item	Unit	Total Qty.	Rate in words(in Rupees)	Rate in figures(in Rs.)	Amount in figures(in Rs.)
1	2	3	4	5	6	7
xxi)	Supplying, installing, testing and commissioning monoblock centrifugal pumping set with mechanical seal, C.I. volute and SS impeller & SS shaft connected to a TEFC induction motor of suitable HP for 415 volts, 3 phase, 50 cycles A.C. supply with 150 mm dia pressure gauge with SS/gunmetal isolation cock, vibration eliminating pads, base plate wiring upto panel and equipment for water level controller to start and stop the pump automatically at predecided levels of the water in the tank with provision of protection for dry run etc. complete in all respect (The shop drawing or the pumps along with its characteristics curves, model and technical data etc. are to be submitted for approval before purchase of pump).					
	Domestic water pumps (Treated water transfer pump to terrace tank)/horticulture					
	Capacity 400 lpm					
	Head 45 M	Each	2.0			
	Note: The cost of chemical & manpower for trial run for period of two month from the date of handing over including the cost of consumables complete as specification as directed .Obtain required no. of test report of treated/raw sewer during trial run. No additional payment shall be made on this account.					
	SUB TOTAL(Sewage Treatment Plant)					

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1	2	3	4	5	6	7
2.00	Operation and maintance of STP & ETP after obtaining approval from State Pollution Control Board/Statutory bodies					
i)	Testing charges of Raw and treated effluent for all the required parameter from approved lab (after defect and liability period of 12 months)	Set	6.0			
ii)	Providing chemical and consumables for satisfactory operation of STP & ETP etc. in all respect excluding cost of electricity and manpower and spare parts during defect liability period i.e. 1 year and also including the cost for providing the on plant training to the respective personnels for operation and maintenance of STP & ETP.	month	12.0			
iii)	Providing (operator & one Helper) i.e. manpower to operate the STP in shift. In case more than one shift required any day, the additional manpower/overtime shall be made accordingly.					
a)	Helper - 1 no./day	Month	24.0			
b)	technical operator - 1 no./day	Month	24.0			
iv)	AMC of all equipments, components and spares of STP & ETP after one year defect liability period.The consumables will be reimbursed by owner as per actual cost.	Year	1.0			
SubTotal(O & M)						

SI. No.	Description of Item	Unit	Total Qty.	Rate in words(in Rupees)	Rate in figures(in Rs.)	Amount in figures(in Rs.)
1	2	3	4	5	6	7
3.00	Effluent Treatment Plant(ETP)					
	Providing and fixing packaged type Effluent treatment plant of non-corrosive material. RCC/MS components with corrosive protection, including design shop drawing and obtain the approval, erection ,commissioning, construction of ETP including civil, mechanical, electrical ,piping work complete in all respect on turnkey basis .The system should be fully automatic with level control, compact, odor free and shall consume low power. ETP of suitable size for 20 KLD required to treat the effluent of Ayurveda hospital by using suitable technology complete in all respect including SS screen,RCC Oil & grease trap,MS flash mixer/tube settler/neutralisation chamber, including pumps and piping, filter, sludge transfer pump.					
	The ETP units shall be designed in such a way that the lab effluent does not effect the function of STP when treated hospital effluent mixed in the domestic sewer line. treated effluent shall meet the DPCC norms &also obtain adequacy report &treated effluent test report for DPCC. Agency has to maintain and operate the ETP during defect liability period including cost of manpower, chemical etc except electricity cost. The system will be below ground level in one corner of STP. The civil quantities will be paid as per actual under civil work head. However other than civil work all MS,SS unit, its paint,FRP inner coating,media,pipe valve, pump,electric panel and fitting,dosing pump,SS agitator, or any other item required for proper functioning of ETP will be considered as the part of ETP. The work shall be carried out as per approval of HSCC. Filter press/Sludge drying bed of STP will also used to handle the sludge of ETP.					
	The ETP has to be designed and installed through the approved vendor (Geo Miller, Ion Exchange, Aquaprocess, LN Tech,Thermax, Pollucon Technologies, AKAR Implex (P) Ltd, Fontus.) or any other approved agency having similar ETP experience	Each	1.0			
	Total for ETP					

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1	2	3	4	5	6	7