

Aavanira Biotech (P) Ltd. Kinetic Innovation Park, D-1 Block, Plot No. - 1B/1 Part,
MIDC Chinchwad, Pune - 411 019, Maharashtra, India.

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CIN NO. U74900PN2010PTC137544



Recognized by Ministry of Environment, Forest & Climate Change (MoEFCC), Govt. of India
ISO 9001: 2015 and ISO 45001: 2018 Certified Company

ENalyze*

Test Report		REPORT NO.-AB/RPO/01/2021-22/250		
Client Details Name & Address: R.P. Enterprises, Shop No. 342, Plot No, 19/C, D1 Block, Heau Industrial Spaces, MIDC Chinchwad, Pune – 411 019 [Site: Sinhgad College of Engineering, Vadgaon Bk.]	Sample Code	AB/01/2021-22/250		
	Sample Name	STP Outlet		
	Sample Collected By	Client		
	Method for Sampling	--		
	Sample Type	Sewage		
	Sample Collected On	14/01/2022		
	Sample Received on Date	14/01/2022		
	Analysis Date	14/01/2022 to 20/01/2022		
	Reporting Date	21/01/2022		
Sample returned /stored		Stored at 4°C for 1 week from the date of reporting		
Sr. No.	Parameter	Results	Units	Standard Method
1	pH	8.36	--	IS: 3025 Part-11 (R.A : 2017)
2	Total Suspended Solids	<10.0	mg/lit	IS: 3025 Part-17 (R.A : 2017)
3	Chemical Oxygen Demand	8.70	mg/lit	IS: 3025 Part-58 (R.A : 2017)
4	Biochemical Oxygen Demand (3 day test@27°C)	2.0	mg/lit	IS: 3025 Part-44 (R.A : 2019)
5	Oil and Grease	<2.0	mg/lit	IS: 3025 Part-39 (R.A : 2021)

Verified By – Quality Manager

Authorized By – Technical Manager /
Dy. Technical Manager

Govt. Analyst
—End of Report—



2. Basics of Water Treatment :

The rain water as it passes through atmosphere picks up dissolve gases. When it comes in contact with the earth, picks up the suspended & dissolved matter. Thus the main impurities in the water can be broadly classified as under :

1. Un dissolved suspended solids
2. Dissolved solids
3. Dissolved gases
4. Other impurities.

The water is used in industry or for drinking which requires certain specifications. The above mentioned impurities are removed through various processes and equipments to give suitable water for each application.

Filtration for removal of un-dissolved suspended solids :

This is commonly known as turbidity. The turbidity in the water ranges very widely from as high as 5,000 to 10,000 PPM in rainy season in river water to almost 0 PPM in bore well water. The turbidity can deposit on heating surfaces, strainers, cooling tower fins and cause clogging.

The turbidity removal is achieved through settling, clarification & filtration.

Pressure Sand Filter :

When the suspended solids are @ 50 - 100 PPM, the filters are used. For highly turbid waters, coagulation, settling is required.

The filtering media in these filters is fine sand. (16/32 mesh) The sand is normally supported on a bed of graded pebbles and silex.

The filter unit has a nest of valves for service, rinse and backwash operation. The filters generally are of down flow configuration and backwash is in upwards direction. The dirt accumulated in service cycle is removed in backwash operation.

Activated Carbon Filter :

Activated carbon filter is one of the most widely used media for absorption of impurities. It is used for de chlorination, removal of organics and removal of odour.

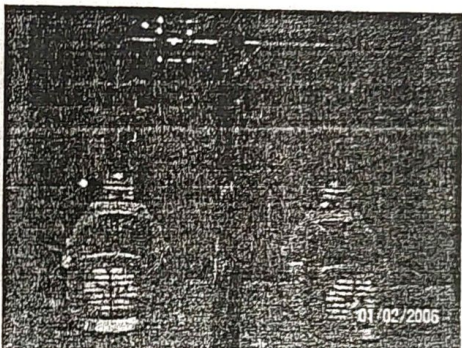
The carbon filter comprises of pressure vessel, nest of valve or multiport valve, associated piping, and carbon media of specified quality depending on application supported by pebbles and silex.

3. Technical specification

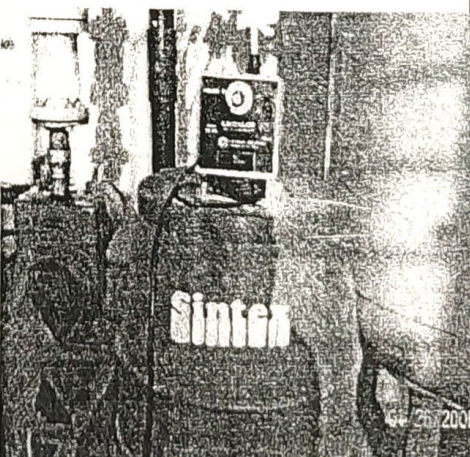
DESIGN BASIS OF PLANT

Raw water turbidity	75 NTU
Output per hour	50000 Ltr / hr
Backwash frequency	Once in day
OUTLET WATER QUALITY	
HARDNESS	No change
TURBIDITY	CRYSTAL CLEAR

Raw water pump :

Make	KBL	
Quantity	2 Nos (1w+1s)	
Type	Submersible	
Model	KOS 830	
Discharge	50 m ³ /hr	
Head	30 Mtr	
Motor rating	10 hp	

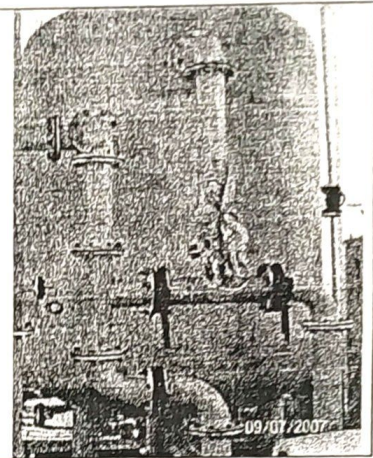
Alum dosing pump _____ :

Make	ASI LMI	
Quantity	1 No	
Type	Electromagnetic	
Model	UC 11	
Discharge	0-5 LPH	
Head	3.5 kg/cm ² .	
Dosing Chemical	Alum	
Dosing tank	100 Ltr Sintex	

Dual Media filter :

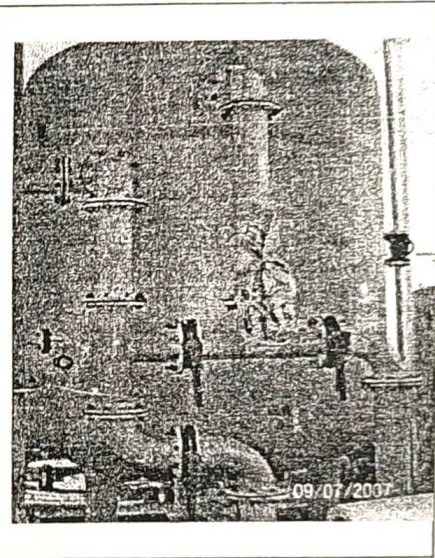
PARTICULARS	D - 1800	
No. of filter	One	
Diameter Of unit	2000 mm	
HOS of unit	2000 mm	

MOC of unit	MS-Epoxy Painted
Fine Sand 16/32	3800 kg
Anthracite 8/16	700 kg
Max. flow rate	50 m3/ hr
Max. pressure drop	0.8 kg / cm2
Backwash flow rate	50 m3 / hr
Frontal pipe size	100 NB
No. of pressure gauges	2
Type of valves	Individual butterfly valve 100 NB Intervalve make



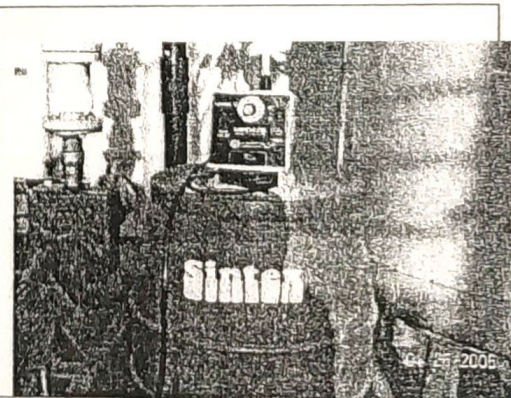
Activated carbon filter :

PARTICULARS	C 2000
No. of filter	One
Diameter Of unit	2000 mm
HOS of unit	2000 mm
MOC of unit	MS-internal epoxy
Carbon Qty 500 IV	1100 kg
Max. flow rate	50 m3/ hr
Max. pressure drop	0.8 kg / cm2
Backwash flow rate	50 m3 / hr
Frontal pipe size	100 NB flange
No. of pressure gauges	2
Type of valves	Individual butterfly valve 100 NB



Chlorine dosing pump :

Make	ASI LMI
Quantity	1 Nos
Type	Electromagnetic
Model	UC 11
Discharge	6 LPH
Head	5 kg/cm2.
Dosing Chemical	Sodium hypo chlorite
Dosing tank	100 Ltr Sintex



4. Process and plant operation

CONTENT

- I. TREATMENT SCHEME
- II. SIGNIFICANCE OF THE EQUIMENTS PROVIDED
- III. INSTRUMENTATION
- IV. FIRST START UP AND RUNNING OF PLANT
- V. REGULAR BACKWASHING OF MULTIMEDIA FILTER
- VI. USAGE OF ELECTROMAGNETIC DOSING SYSTEM

I. TREATMENT SCHEME

Alum is dosed in the raw water tank for better filtration. The raw water is taken to the Sand Filter, through raw water pump from raw water tank which removes the turbidity and suspended matter and Carbon Filter removes odor, smell then the water flows at the out let of carbon filter metering pump is provided for chlorine dosing online to remove bacteria. Then water goes in to the treated water tank.

II. Significance of the equipments provided

Pressure sand Filter :

This is a pressure filter where the filtering media is various layers of sand stacked one above each other. The coarser particles are at the bottom & finer particles are at the top. They are stacked inside the vessel. The frontal pipe work has nest of butterfly valves which are used for various operation like service, backwash & rinse. The filter needs to be backwashed intermittently so as to loosen the filter bed & drain out the dirt accumulated. Anthracite is used to improve the filtration efficiency.

Activated carbon Filter :

This unit is having similar construction like pressure sand filter but difference is only about top layer of filtering layer. Instead of fine sand activated carbon is provided. This is a pressure filter where the filtering media is various layers of sand stacked one above each other. The coarser particles are at the bottom & finer particles are at the top. They are stacked inside the vessel. The frontal pipe work has nest of butterfly valves which are used for various operation like service, backwash & rinse. The filter needs to be backwashed intermittently so as to loosen the filter bed & drain out the dirt accumulated.

III : Instrumentation

Pressure gauges

On inlet & outlet of each unit.

Sampling valves

Across the units to measure the quality

Flow meter

At the outlet to measure flow rate

IV. FIRST START UP AND RUNNING OF PLANT

- Ensure that all on inlet, outlet, drain, Connections are completed with reference to P & I diagram.
- Ensure that pump operation is checked, rotation direction is checked and water is flowing at rated capacity.
- Ensure that inlet isolation valve is provided near rigid piping.
- Any dirt accumulated in pipeline is flushed out by opening V1 & V4 valves of pressure sand filter. Start the pump and flush the dirt & after 2-3 min. shut off the pump and open valve V3 & V4 for backwashing of sand filter. Initially open V 12 to expel all air trapped in the filter. During the backwash cycle raw water will enter from bottom and will taken out from the top.
- The sand bed gets washed. Ensure that the filter media does not come out in drain. If it comes, regulate the inlet valve. Continue backwash for next 10 min. And shut off the pump.
- Now open valve V1 & V5 and close valve V3 & V4 again start the pump. During this operation sand filter get rinsed Put multiport valve in no. 3 position now and start the pump, now the water would go in to the unit from top and water would come out from bottom and go to drain. Continue rinsing for 3 - 5 min., allow the filter bed to settle down and open valve V2 and close valve V5. The unit is now service condition.
- Now the water enters the activated carbon filter. Repeat above procedure for activated carbon filter for backwashing and rinsing of carbon bed. The activated carbon bed gets washed and eludes particles and black colour initially. Ensure that the activated carbon does not come out in drain. If it comes, regulate the inlet valve. Continue backwash for next 10 min. And shut off the pump.
- Take the carbon filter I service position by opening V1 & V2 for activated carbon filter.

V. Regular backwashing of sand filter

- This operation should be done once in a day. Open valve V3 & V5 for sand filter and start the pump. The inlet valve should be opened in such a way that the media inside does not come out. The water enters in upward direction and it is taken out from the drain point. Initially we need to open V 12 to expel air trapped in the filter.
- Continue backwash for 10 minutes and getting backwashed shut off the pump and close valve V3 & open valve V1 and start the pump. Continue Rinse operation for 5 minutes and shut off the pump. Now close valve V5 and open valve V2 which is service operation. After sand filter backwashing is done

take carbon filter for backwash and rinse, repeat the same procedure for activated carbon filter.

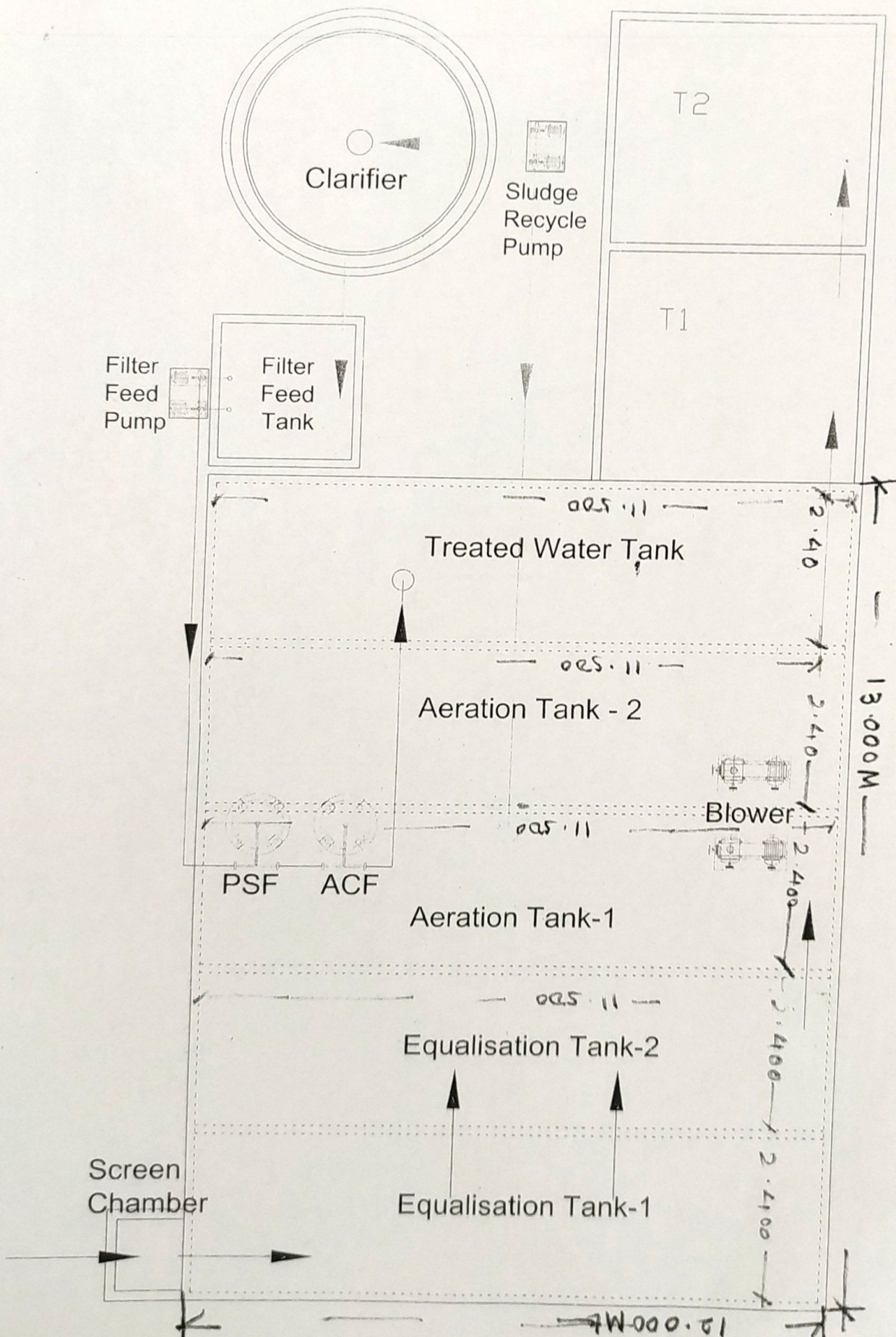
- Backwash operation is necessary to loosen the filter bed and take out dirt accumulated if any during last service cycle.
- Backwash should be done once in 1 day for 10 – 15 minutes. The frequency may have to be increased in case of turbid water in rainy season.

G. Usage of electrical dosing system.

1. Dosing pump is used to dose sodium hypochlorite or alum online in to the treated water line after pump no 2.
2. The dosing rate should be adjusted in such a way that the free chlorine of 0.2 to 0.5 ppm is maintained in over head tank. This can be checked with the Chlorotex reagent supplied with the unit.
3. Take 50 ml water and add 5 ml. Chlorotex reagent and compare the colour with the colour chart printed on the bottle. The colour should be light pink to orange for our use.
4. The dosing system is online whenever the pump starts it starts dosing at required proportion.(OPTIONAL)
5. Once the dosing flow is set and solution concentration is adjusted, prepare hypochlorite solution only for 2-3 days in specified quantity, because the chlorine solution evaporates very fast.

5. IMPORTANT NOTES

- Use inlet isolation valve or shut off the pump during shifting of valve position every time this is a must to avoid breakage of disk within the multiport valve.
- The unit should always be filled with water when not in use.
- The max. Allowable pressure of the unit is **3.5 kg/cm²**. (we have provided pressure gauge along with the unit. The purpose of this is to safeguard vessel against the risk of damage due to increase in pressure)
- Firmly grip the handle and rotate in clock wise direction only to the next position. Do not attempt to lift and turn the handle.
- Do not run the unit more than capacity mentioned in technical specification which may lead to inferior treated water quality.



Layout cum Flow Diagram of STP

$12.000 \times 11.500 \times 2.00 \text{ (wt. ht)} = 276 \text{ m}^3 \text{ or } 276 \text{ KLD.}$

RCC Tank $(12.00 \times 11.500 \times 3.00 - \text{water level: } 2 \text{ MD})$

P.O.No. 01 /21-22

Date :- 06.04.2020

To,
M/s. RP Enterprises
J/SEI-12/3, 'J' Block,
Near Indrayani Nagar Corner,
Opp. Mega fiber, MIDC, Bhosari,
Pune- 411 026.

Sub :- Annual Maintenance Contract for Operation and Maintenance of 275 KLD Sewage Treatment Plant at STES Campus Vadgaon.

Sir,

This has reference to your quotation no. RPE/2021/014 dated 05.04.2021 and subsequent discussion you had with our Project Manager and we have pleasure in placing the Work Order for the above mentioned works at the rates mentioned in Bill of Quantities- Annexure-I

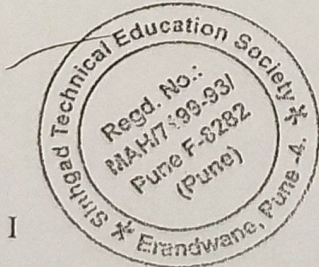
The undersigned, agrees with the estimated cost of **Rs. 42,000.00 (Rupees Forty Two Thousand only.)** as per Annexure - I enclosed. However, the payment shall be made as per the actual measurements jointly recorded and accepted.

Unit rate quoted is inclusive of all taxes and duties and no extra payment is allowable on account of any tax / duties.

Please return copy of this Work order with Annexure I duly signed in token of your acceptance.

Thanking you,
Yours faithfully

M.N. NAVALE
PRESIDENT
Encl : Annexure - I



12/04/21

Bill of Quantities

AMC Period – 1st January 2021 to 31st December 2021

Name of work- Annual Maintenance Contract for Operation and Maintenance of 275 KLD Sewage Treatment Plant at STES Campus Vadgaon.

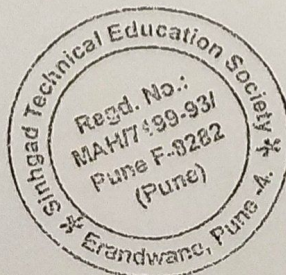
1. Scope:

- a) Skilled Manpower shall be employed round clock i.e. for 24 hrs for 365 days to operate the plant for required number of hrs.
- b) You shall take care of routine maintenance of the equipment which include and limited to oil replacement in the blower, greasing of pump, belt replacement excluding major maintenance.
- c) One of your Senior Engineer/Environmental Engineer shall visit the plant weekly to ensure proper maintenance and operation of the plant to ensure the efficiency to the same, he will be reporting to site engineer.
- d) Preparation of STP related documents i.e. Log Sheets, Chemical Consumption Record, Energy Meter and Water Meter records etc.
- e) Providing Safety gadgets such as Uniform, Safety shoes, Mask, Goggles, Hand Gloves etc. to the workmen.
- f) Providing Technical support during Audit and MPCB related Visits.
- g) Water test report to be submitted yearly twice.

2. Outside the Scope :

- a) Supply of Chemicals and Spares.
- b) All spare required for replacement with normal wear and tear.
- c) Supply of Fresh water line, Uninterrupted power supply.
- d) Sludge Collection and disposal from the Sludge pump.

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3. Price :

The price for Operation and Maintenance shall be Rs. 42,000.00 per month including GST.

4. Payment :

Payment shall be made within 15 days on submission of bill duly certified by our Site Engineer.

5. Termination :

By giving one month notice in writing by either party.

6. Compensation :

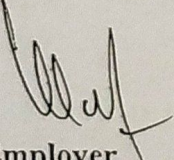
If the plant is not run the required number of hrs. on any day the compensation shall be recovered at the Rate of Rs. 1500/- per day.

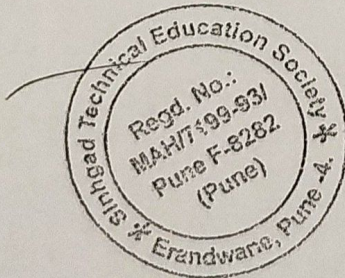
7. General :

Any other condition can be finalized by mutual agreement.

Daily record to be maintained in Register.

Note: If work not found satisfactory, P.O. will be cancelled.


Employer



Contractor

P.O.No. 21 /21-22

Date :- 20.12.2021

To,
M/s. RP Enterprises
J/SEI-12/3, 'J' Block,
Near Indrayani Nagar Corner,
Opp. Mega fiber,MIDC, Bhosari,
Pune- 411 026.

**Sub :- Annual Maintenance Renewal Contract for Operation and Maintenance of 275 KLD
Sewage Treatment Plant at STES Campus Vadgaon.**

Sir,

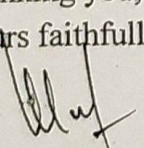
This has reference to your quotation no. RP/STP/321/2021 dated 05.12.2021 and subsequent discussion you had with our Project Manager and we have pleasure in placing the Work Order for the above mentioned works at the rates mentioned in Bill of Quantities- Annexure-I

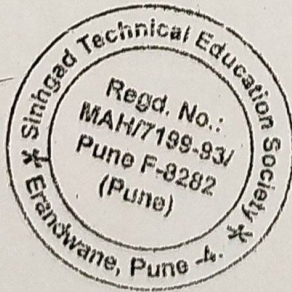
The undersigned, agrees with the estimated cost of **Rs. 45,000.00 (Rupees Forty Five Thousand only.)** as per Annexure - I enclosed. However, the payment shall be made as per the actual measurements jointly recorded and accepted.

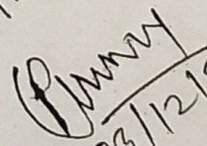
Unit rate quoted is inclusive of all taxes and duties and no extra payment is allowable on account of any tax / duties.

Please return copy of this Work order with Annexure I duly signed in token of your acceptance.

Thanking you,
Yours faithfully


M.N. NAVALE
PRESIDENT
Encl : Annexure - I



Received.

23/12/21

AMC Period – 1st January 2022 to 31st December 2022

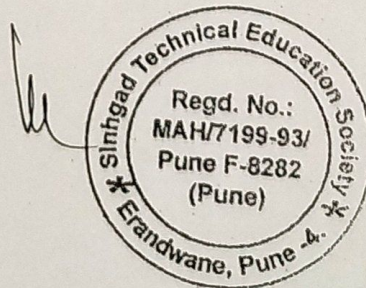
Name of work- Annual Maintenance Renewal Contract for Operation and Maintenance of 275 KLD Sewage Treatment Plant at STES Campus Vadgaon.

1. Scope:

- a) Skilled Manpower shall be employed round clock i.e. for 24 hrs for 365 days to operate the plant for required number of hrs.(Two operate for 24 hrs.)
- b) You shall take care of routine maintenance of the equipment which include and limited to oil replacement in the blower, greasing of pump, belt replacement excluding major maintenance.
- c) One of your Senior Engineer/Environmental Engineer shall visit the plant weekly to ensure proper maintenance and operation of the plant to ensure the efficiency to the same , he will be reporting to site engineer.
- d) Preparation of STP related documents i.e. Log Sheets, Chemical Consumption Record, Energy Meter and Water Meter records etc.
- e) Providing Safety gadgets such as Uniform, Safety shoes, Mask, Goggles, Hand Gloves etc. to the workmen.
- f) Providing Technical support during Audit and MPCB related Visits.
- g) Water test report to be submitted yearly twice.

2. Outside the Scope :

- a) Supply of Chemicals and Spares.
- b) All spare required for replacement with normal wear and tear.
- c) Supply of Fresh water line, Uninterrupted power supply.
- d) Sludge Collection and disposal from the Sludge pump.



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3. **Price** :

The price for Operation and Maintenance shall be Rs. 45,000.00 (**Rupees Forty Five Thousand only.**) per month including GST.

4. **Payment** :

Payment shall be made within 15 days on submission of bill duly certified by our Site Engineer.

5. **Termination** :

By giving one month notice in writing by either party.

6. **Compensation** :

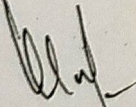
If the plant is not run the required number of hrs. on any day the compensation shall be recovered at the Rate of Rs. 1500/- per day.

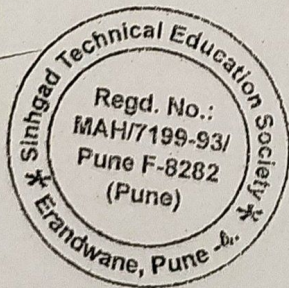
7. **General** :

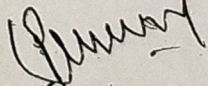
Any other condition can be finalized by mutual agreement.

Daily record to be maintained in Register.

Note: If work not found satisfactory, P.O. will be cancelled.


Employer




Contractor