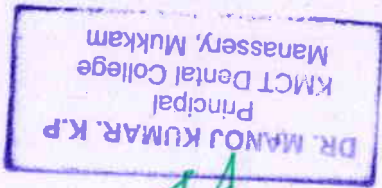
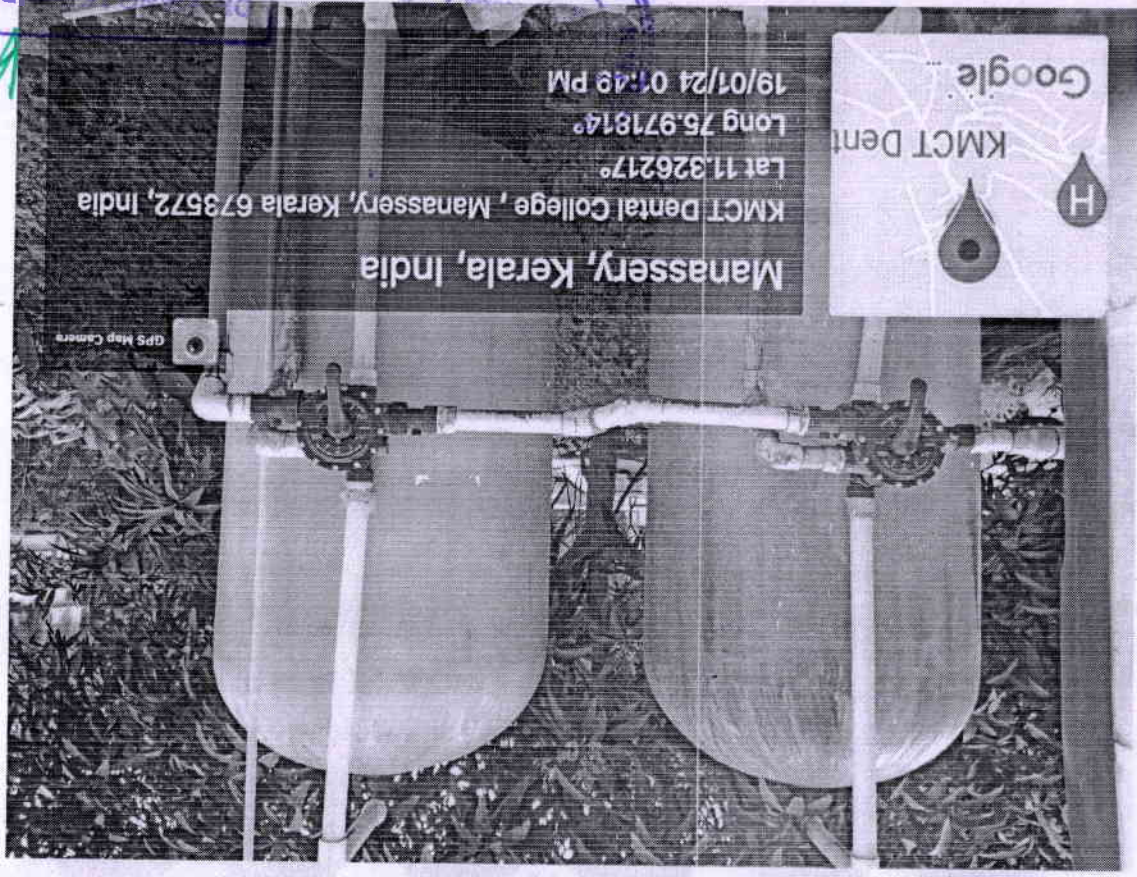
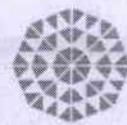


**7.1.5 - WATER CONSERVATION FACILITIES AVAILABLE IN THE
INSTITUTION**

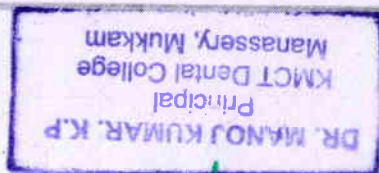
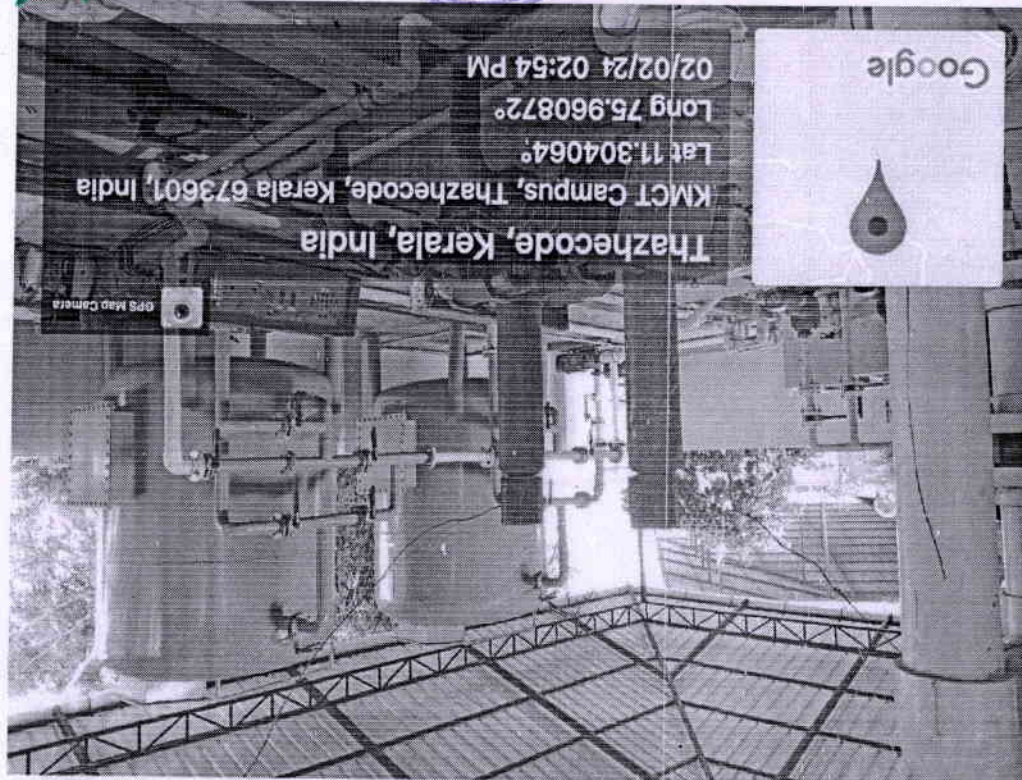
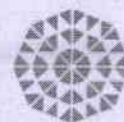


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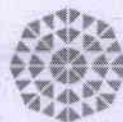


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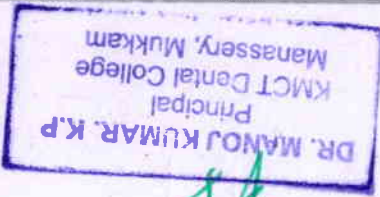
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7.1.5 WATER CONSERVATION FACILITIES



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KSCSTE - CENTRE FOR WATER RESOURCES DEVELOPMENT AND MANAGEMENT

(An ISO 9001 : 2015 Certified Organization)
An Institution of Kerala State Council for Science, Technology & Environment, Govt of Kerala



CWRDM WATER QUALITY DIVISION-TESTING LABORATORY

TEST REPORT

No: CWRDM/WQD/WA/2024/8793(2)

Customer Name and Address: M/s. KMCT Hospital Mannassery

Information Provided by Customer:

Date of Issue	06-10-2024
Date of receipt of sample	16-09-2024
SRF No	8593(2)
Test Report No	8793(2)
Analysis Started	16-09-2024
Analysis Completed	25-09-2024

Water Sample (1L, Sample-2, Pipe Water-Pay Ward)
Party

Sl. No.	Parameters	Test Method	Result	Limit of Quantification (LOQ)	Acceptable limit as per IS 10500:2012
1	pH at 25°C	APHA, 2023 (Part 4500 H+ B)	7.10	1.0	6.5-8.5
2	Colour, Hazen	APHA, 2023 (Part 2120 B)	BDL	1.0	5.0
3	Turbidity, NTU	APHA, 2023 (Part 2130 B)	0.20	0.20	1.0
4	Total Dissolved Solids, mg/l	APHA, 2023 (Part 2540 C)	236.0	10.0	500.0
5	Total Hardness as CaCO ₃ , mg/l	APHA, 2023 (Part 2340 C)	78.0	2.0	200.0
6	Total Alkalinity as CaCO ₃ , mg/l	APHA, 2023 (Part 2320 B)	28.0	2.0	200.0
7	Chloride as Cl ⁻ , mg/l	APHA, 2023 (Part 4500 Cl B)	66.0	4.0	250.0
8	Sulphate as SO ₄ ²⁻ , mg/l	APHA, 2023 (Part 4500 SO ₄ ²⁻ E)	4.50	1.0	200.0
9	Calcium as Ca, mg/l	APHA, 2023 (Part 3500 Ca B)	21.73	1.0	75.0
10	Magnesium as Mg, mg/l	APHA, 2023 (Part 3500 Mg B)	5.66	1.0	10.0
11	Iron as Fe, mg/l	APHA, 2023 (Part 3500 Fe B)	BDL	0.20	1.0

BDL-Below Detection Level

*****End of the Report*****

For CWRDM, Water Quality Division - Testing Laboratory

Authorised Signatory

DR. MANOJ KUMAR K.P.

Tested by

MAT

Note: This test report refers only to the particular item(s) submitted for testing. The test results reported in this report are valid at the time of and under the stated condition of measurement. This particular test report cannot be reproduced except in full, without prior permission of Head - Water Quality Division of the laboratory. Any discrepancies may be brought to the laboratory within 30 days of the issue of the report.

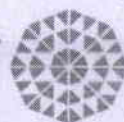
Kurumanangalam, Kozhikode-673571, Kerala, India

E-mail: ad@kdmct.edu.in



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WATER QUALITY DIVISION

CENTRE FOR WATER RESOURCES DEVELOPMENT AND MANAGEMENT
KOZHIKODE-673571

TEST RESULTS- BACTERIOLOGICAL ANALYSIS

Sl. No.	Parameters	Test Method	Result	Acceptable limit as per IS 10500:2012
1	Total Coliforms, CFU/100ml	APHA, 2023(Part 9222 B)	Absent	Shall not be detectable in any 100ml sample
2	E.coli, CFU/100ml	APHA, 2023(Part 9222 G)	Absent	Shall not be detectable in any 100ml sample

Note:-

All the tested water quality parameters are found to be within the acceptable limit as per IS 10500:2012, Drinking Water Specification:

*****End of the Report*****

For CWRDM, Water Quality Division - Testing Laboratory

Authorised Signatory

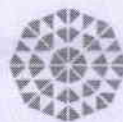
Tested by

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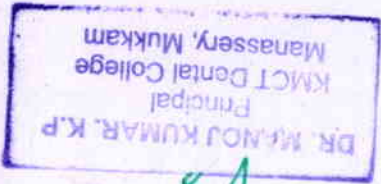


Key Observations

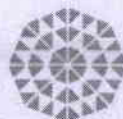
1. **Chemical Parameters:**
 - All chemical parameters are within the acceptable limits specified by IS 10500:2012.
 - Key values like pH, Total Hardness, TDS, Chloride, and Sulphate indicate the water quality is suitable for drinking purposes.
2. **Microbiological Parameters:**
 - Both **Total Coliforms** and **E. coli** were absent, confirming no bacterial contamination.
3. **Color and Turbidity:**
 - Both parameters are below the detection limit, indicating the water is clear and visually acceptable.

Conclusion

The water sample from KMCT Hospital, Manassery, Manassery, complies with the IS 10500:2012 standards for drinking water. It is safe for consumption based on the parameters tested.



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KMCT/DC/2024/209

DATE: 22/03/2024

CERTIFICATE

This is to certify that a sewage treatment plant has been successfully installed at KMCT Campus since 5 years. This facility has been designed and implemented in accordance with the applicable regulations and standards of Pollution Control Board, Government of Kerala.

This sewage treatment plant has been installed to effectively treat wastewater generated within the premises of KMCT, ensuring compliance with environmental regulations and contributing to sustainable water management practices. The system is designed to remove contaminants from sewage, thereby reducing the environmental impact of wastewater discharge.

We hereby confirm that the installation of the sewage treatment plant has been completed satisfactorily, and it is operational and is being maintained on an annual maintenance by the in house maintenance team as per the specified parameters.

Dileep K
22/3/24
DILEEP

IN-CHARGE
SEWAGE TREATMENT PLANT

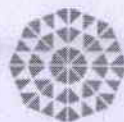
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Manassery, Mulkam

PRINCIPAL



DR. MANOJ KUMAR K.P
Principal
KMCT Dental College
Manassery, Mulkam

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KMCT/DC/2024/209

DATE: 22/03/2024

CERTIFICATE OF BOREWELL MAINTENANCE

This is to certify that the borewells located at [KMCT Campus has been maintained in accordance with the prescribed standards and guidelines. The maintenance activities have been carried out to ensure the optimal performance and longevity of the borewell system.

Maintenance Activities Undertaken:

1. **Regular Inspection:** The borewell has been regularly inspected to check for any signs of damage or malfunction.
2. **Cleaning:** Periodic cleaning of the borewell casing and screens has been carried out to remove sediment and debris.
3. **Pump Maintenance:** The pump, if installed, has been serviced and maintained as per manufacturer recommendations.
4. **Water Quality Testing:** Water samples have been collected and tested periodically to ensure compliance with water quality standards.

We hereby confirm that the borewell maintenance activities have been conducted as per the established procedures and standards, contributing to the efficient operation and sustainability of the water supply system.

LATHEESH

SUPERVISOR

KMCT MAINTENANCE TEAM



DR. MANOJ KUMAR, K.P.
Principal
KMCT Dental College
Mukkum, Mukkum

PRINCIPAL

DR. MANOJ KUMAR, K.P.
Principal
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Mukkum, Mukkum

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Proposal for Sewage Treatment Plant

Design Capacity: 500 m³/day (5,00,000 litre per day)

For

KMCT Medical College Hospital,
Manassery, Kozhikode, Kerala



Biocoenosis Envirotech

No. 51/753, Kanjani Road,
Near Star Plastic, Chungam, Ayyanthol P. O.,
Thirissur - 03, Kerala

Mob: +91 8086858696, 9072333110

Email: biocoeninda@gmail.com, hameeshpanicker@biocoenosis.com

Web: www.biocoenosis.com

Environmental Consultant

Hameesh Panicker,

M. Sc. Environmental Engineering

Mob: 08086858696



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Manassery, Mulkam

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500 CMD Sewage Treatment Plant

The Consultant...
Haneesh Panicker, M. Sc. Envtl. Engineering

DR. MANOJ KUMAR, K.P.
Principal
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Manassery, Makkam

3. Screening of Sullage

2. Septic Tank

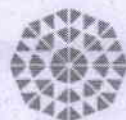
A septic tank is a key component of the septic system, which is a type of On-Site Sewage Facility (OSSF). The term "septic" refers to the anaerobic bacterial environment that develops inside the tank and which decomposes or mineralizes the waste discharged into the tank. Periodic preventive maintenance is required to remove the irreducible solids which settle and gradually fill the tank, reducing its efficiency. A properly maintained system, on the other hand, can last for decades and possibly a lifetime. The liquid then draining in a relatively clear condition from the outlet is routed to equalization tank.

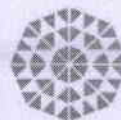
1. Screening of Sewage

Sewage is the wastewater generated from water closet. It may contain unwanted non-biodegradable material along with its flow. So the sewage will be passed through the screen before it is entering into the Septic Tank. The coarse particle deposited on the screen should be cleaned manually and screening should be done properly for the protection of the pumps and plumbing line. Non-biodegradable solid obtained after the screening shall be subjected to land fill or sanitary disposal.

1. Screening of Sewage

2. Septic Tank
3. Screening of Sullage
4. Oil Separator
5. Equalization and Pumping
6. Aerobic Treatment System
 - ◊ MBBR System
 - ◊ Air Diffuser
 - ◊ Secondary Settling
7. Chemical Treatment
 - ◊ Flocculation
 - ◊ Tertiary Settling
8. Filtration System
 - ◊ Pressure Sand Filter
 - ◊ Activated Carbon Filter
9. Disinfection System
10. Treated Water Collection
11. Sludge Drying Bed





Design Approach

The Wastewater generated from the hospital project is classified as Sewage and Sullage; sewage is the wastewater generated from water closet, where sullage is the wastewater generated from its Bathrooms and Wash Area. It should be treated separately because of the difference in its characteristics. A separate system is proposed for the treatment of wastewater generated.

Design Parameters

Total water consumption	=	5,88,000 litres per day
Total wastewater generation	=	4,99,800 litres per day
Design Capacity of STP (Say)	=	5,00,000 litres per day
Or		
	=	500 m ³ /day

Influent Characteristic

Parameters	Units	Value
Biochemical Oxygen Demand (BOD ₅)	mg/l	350
Chemical Oxygen Demand (COD)	mg/l	750
pH	Units	6.00-7.00
Total Suspended Solids (TSS)	mg/l	200
Total Dissolved Solids (TDS)	mg/l	1000
Total Organic Nitrogen (Kjeldhal)	mg/l	>35 <55
Oil and Grease	mg/l	>10 <20

Treated Water Characteristic

Parameters	Units	Value
Biochemical Oxygen Demand (BOD ₅)	mg/l	<10
Chemical Oxygen Demand (COD)	mg/l	<50
pH	Units	6.5 - 7.5
Total Suspended Solids (TSS)	mg/l	<10
Total Dissolved Solids (TDS)	mg/l	1500
Total Organic Nitrogen (Kjeldhal)	mg/l	<5
Oil and Grease	mg/l	<0.1

Process Description

Proposed Wastewater Treatment System consists of following

1. Screening of Sewage

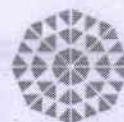
500 CMD Sewage Treatment Plant

The Consultant.....
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Manassery, Mulkam



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solids shall be subjected to land filling or sanitary land filling or dried and incinerated. After proper screening the sludge will be channeled to grit cum oil separator

4. Grit cum Oil Separator

Just after the preliminary screening the wastewater shall be passed through oil separator, in which the heavy solid particle will be settled down at the bottom of first compartment, oil and grease will float at the second compartment, which shall be removed manually and stored for further treatment and disposal on a regular basis. Water flowing out from oil separator will be almost free from oil content and it shall be treated effectively in the further unit process reactors. Water flows out from the oil separator shall be channeled to the equalization tank.

5. Equalization Tank and Pumping System

Over flow water from the primary settling tank shall be collected in an equalization tank along with the sewage flow out from septic tank, which is also designed with a capacity to hold the peak flow. The tank shall be designed with a retention time of 12 hrs. Wastewater from the equalization tank shall be uniformly pumped to next unit using submersible/Monoblock pumps. Two pumps will be used for pumping the wastewater, one pump will be on duty and the other will be on standby mode.

6. Aerobic Treatment System

Proposed aerobic treatment system is Moving Bed Bio Reactor (MBBR) system. This system will have three major components.

- Bio media for the growth of bio-film
- Aeration System
- Secondary Settling Tank

MBBR System

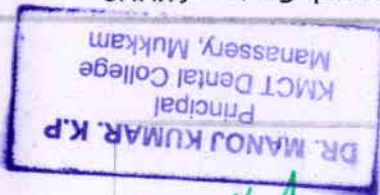
In this process, suspended organic matter in the wastewater shall be degraded by the metabolism of Aerobic Bacteria. Fill film media shall provide adequate surface area for the attached growth of microbes, which will consume and degrade the waste contained in wastewater. Wastewater from the collection tank shall be fed from the top of the reactor. The wastewater is made in contact with the bio media packed in the tank. Bio-media in the tank shall be fluidized inside the aeration tank. This will act as the medium for the growth of microorganism in the reactor. The out let of Aeration Tank is let into Secondary Settling Tank for further treatment.

Aeration System

Diffused aeration will be provided from the bottom of the tank. Two air blowers are used for adequate supply of air. One blower will be on duty and the other one will be on standby. 24 hours aeration will be maintained inside the aeration tank to stabilize the microbial growth.

500 CMD Sewage Treatment Plant

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500 CMD Sewage Treatment Plant

K. Disinfection System – Hypochlorite Dosing

Accessories	=	1 set	Dosing pump with tank
Number of Dosing System	=		
Complete with all accessories like valves, connecting pipe, pressure gauges, Activated Carbon supporting structure and backwash arrangement	=		
Filtering Media	=		pebble, and sand
Valves	=		Frontal Pipe
Type	=		Vertical
Material of Construction	=		MS
Size	=		1.75 m Dia x 2.25 m Height
Nos. off	=		1

J. Activated Carbon Filter

Complete with all accessories like valves, connecting pipe, pressure gauges, Sand, supporting structure and backwash arrangement	=		
Filtering Media	=		pebble, and sand
Valves	=		Frontal Pipe
Type	=		Vertical
Material of Construction	=		MS
Size	=		1.75 m Dia x 2.25 m Height
No of PSF	=		1

I. Pressure Sand Filter

Rating	=		10 HP
Make	=		Kirloskar/Eqvt
Type	=		Clear Water pump
Head	=		30 MLC
Capacity	=		50 m ³ /hr
Nos. off	=		1 + 1 stand by
II. Filter Feed Pumps	=		
Tank	=		HDPE
Dosing Pump	=		e-dose/UKL/Blackstone/Eqvt.
Accessories	=		Dosing Pump with Tanks
Number of Dosing System	=		1 set – 4 numbers
Make	=		Kirloskar/Crompton Greaves
RPM	=		1440
Rating	=		15 HP

G. Dosing System

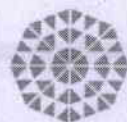
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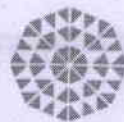


500 CMD Sewage Treatment Plant

A. Wastewater Transfer Pumps	Number of Pumps Required	=	1+1 Standby
	Capacity	=	25 m ³ /hr
	Head	=	10-16 meter liquid column
	Type	=	Open Impeller, Non Clogging, Submersible
	Make	=	Kirloskar/DAB/CG/Eqvt.
	Rating	=	3 HP
B. Sludge Transfer Pumps	Number of Pumps Required	=	2
	Capacity	=	15.00 m ³ /hr
	Head	=	16 meter liquid column
	Type	=	Open Impeller, Non Clogging, Self-Priming/Centrifugal Pump,
	Make	=	Open Cast Kirloskar/DAB/CG/Eqvt.
	Rating	=	2 HP
C. Bio Media	Quantity	=	50 m ³
	Material	=	Virgin Poly propylene with UV stabilizers
	Model	=	Tecpro MBBR media
	Specific Surface Area	=	427 m ² /m ³
D. Aeration Manifold	Number of Aeration Manifold	=	18 numbers
	Make	=	BIOCOEN
E. Blowers	Number of Blowers	=	1+1 Standby
	Capacity	=	450 cum/hr
	Head	=	0.40 Bar
	Make	=	Everest/Inkersolrand/Eqvt.
F. Driving Motor	Number of Motor	=	1+1 Standby

2. Mechanical Equipment (Will be Provided by us)





N. Sludge Drying Bed
No. of Units
Length
Width
Depth

= 3 units
= 7.50 m
= 5.00m
= 1.25 m + (0.25 m Free Board)

500 CMD Sewage Treatment Plant

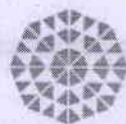
The Consultant.....
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G. Aeration Tank - 2

Length	=	5.00 m	
Width	=	5.00 m	
Depth	=	3.00 m + (0.50 m Free Board)	
$L*W*H = 5.00*5.00*3.50$ m			

H. Secondary Settling Tank

Length	=	5.00 m
Width	=	5.00 m
Depth	=	2.00 m + (0.50 m Free Board)
Cone Depth	=	1.00 m

I. Flocculation Tank

Length	=	4.50 m	
Width	=	0.75 m	
Depth	=	0.75 m + (0.50 m Free Board)	
$L*W*H = 4.50*0.75*1.25$ m			

J. Tertiary Settling Tank

Length	=	5.00 m
Width	=	5.00 m
Depth	=	2.00 m + (0.50 m Free Board)
Cone Depth	=	1.00 m

K. Filter Feed Tank

Length	=	5.00 m	
Width	=	5.00 m	
Total Depth	=	3.00 m + (0.50 m Free Board)	
$L*W*H = 5.00*5.00*3.50$ m			

L. UF Feed Tank

Length	=	5.00 m
Width	=	5.00 m
Total Depth	=	3.00 m + (0.50 m Free Board)
$L*W*H = 5.00*5.00*3.50$ m		

M. Treated Water Collection Tank

Length	=	5.00 m
Width	=	5.00 m
Total Depth	=	3.00 m + (0.50 m Free Board)
$L*W*H = 5.00*5.00*3.50$ m		

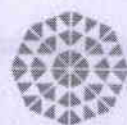
500 CMD Sewage Treatment Plant



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Unit Size and Specifications

1. Civil Works (client's scope if RCC)

A. Sewage - Screen Chamber			
Length	=	1.50 m	
Width	=	0.75 m	
Depth	=	0.50 m + (0.25 m Free Board)	
$L*W*H = 1.50*0.75*0.75 \text{ m}$			

B. Septic Tank			
Length	=	10.00 m	
Width	=	5.00 m	
Total Depth of Septic Tank	=	3.00 m + (0.50 m Free Board)	
$L*W*H = 10.00*5.00*3.50 \text{ m}$			

C. Sullage - Screen Chamber			
Length	=	1.50 m	
Width	=	1.00 m	
Depth	=	0.75 m + (0.25 m Free Board)	
$L*W*H = 1.50*1.00*1.00 \text{ m}$			

D. Oil Separator			
Length	=	3.00 m	
Width	=	1.25 m	
Depth	=	1.25 m + (0.25 m Free Board)	
Depth the hoper bottom	=	0.50 m	
$L*W*H = 3.00*1.25*2.00$			

E. Equalization Tank			
Length	=	8.00 m	
Width	=	6.00 m	
Depth	=	3.00 m + (0.50 m Free Board)	
$L*W*H = 8.00*6.00*3.50 \text{ m}$			

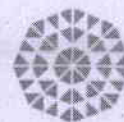
F. Aeration Tank - 1			
Length	=	5.00 m	
Width	=	5.00 m	
Depth	=	3.00 m + (0.50 m Free Board)	
$L*W*H = 5.00*5.00*3.50 \text{ m}$			

500 CMD Sewage Treatment Plant



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Re



Control System

Sl. No.	Item	Operation Control		Dependencies
		Start	Stop	
1.	Sewage Transfer Pumps	Manual/Auto	Manual/Auto	Timer/Float
2.	Blowers	Manual/Auto	Manual/Auto	Timer
3.	Filter Feed Pump	Manual/Auto	Manual/Auto	Float
4.	Dosing Pump	Manual/Auto	Manual/Auto	On when Sewage Transfer Pump is ON
5.	Sludge Transfer Pump	Manual	Manual	Nil
6.	Chlorine Dosing Pump	Manual/Auto	Manual/Auto	On when Filter Feed Pump is ON

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Equipment will be required for the installation of STP

The system will have following major components

Sl. No.	Item	Make/ Material of Construction	Quantity
1	Sewage Transfer Pump	Sharp Point/ Kirloskar	2 Nos
2	Sludge Transfer Pump	Kirloskar/KSB/Crompton	2 No.
3	Screen Chamber	SS	2 Nos
4	Sewage Screen, Septic Tank, Sullage Screen, Grit cum Oil Separator, Flocculation Tank, Primary Settling Tank, Equalization Tank, Aeration Tank, Secondary Settling Tank, Flocculation Tank, Tertiary Settling Tank, Filter Feed Tank, Treated Water Collection Tank, Sludge Drying Bed	Civil Work	1 Set
5	Chemical Tank	Syntax Tank	5 Nos
6	Dosing Pump	Black stone/UKL/e-dose	5 Nos
7	Aeration Manifold	PPR/CPVC	20 Nos
8	MBBR media	Poly Propylene FM/22	20.00 m ³
9	Blower	Everest/Inkersol	2 Nos
		Rand/HPE/Eqvt – 450 m ³ /hr at 4 m head	
10	Filter Feed Pumps	Kirloskar/ Eqvt – 7.5 HP	2 Nos
11	Pressure Sand Filter	1.50m dia x 2.25 m Height M. S. Tank	1 No.
12	Activated Carbon Filter	1.50m dia x 2.25 m Height M. S. Tank	1 No.
13	Micron Cartridge Filter	FRP Jumbo Cartridge	2 No.
14	Ultra-filtration system	Qua	15 m ³ /hr
15	Interconnecting Pipeline	High Pressure PVC	1 lot
16	Chlorine Dosing System	e-dose	1 No.
17	Valves	PP/HDPE	As per requirement
18	Cables	DI core	100 m
19	Copper Earthing		100 m
20	Control Panel		1 Set

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Sludge contains a high concentration of solids, but its water content is still high. Combined primary and secondary sludge from an activated sludge treatment plant contains about 2 % solids and hence 98 % water. One kg of dry sludge is associated with 49 L of water. Thickening is carried out in a sedimentation tank or in a sedimentation pond. The latter is advantageous if land area is available, because the sludge can be allowed to settle over a much longer period and a higher solids content of the thickened sludge is achieved. Dried sludge can be used as manure, further treatment.

12. Sludge Drying Bed

12. Sludge Drying Bed

11. Treated Water Collection and Disposal

Water flowing out from the filter shall be collected in treated water collection tank. The treated water from collection tank is pumped to overhead flush water tanks for using it as flush water, gardening and floor washing. Excess water generated after the treatment shall be disposed to land for percolation through soak pit.

11. Treated Water Collection and Disposal

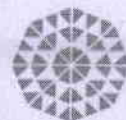
10. Ultrafiltration System

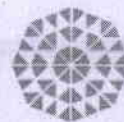
Ultrafiltration (UF) is a variety of membrane filtration in which forces like pressure or concentration gradients leads to a separation through a semipermeable membrane. Suspended solids and solutes of high molecular weight are retained in the so-called retentate, while water and low molecular weight solutes pass through the membrane in the permeate. This separation process is used in industry and research for purifying and concentrating macromolecular (103 - 106 Da) solutions, especially protein solutions. Ultrafiltration is not fundamentally different from microfiltration, nanofiltration or membrane gas separation, except in terms of the size of the molecules it retains - it is defined by the Molecular Weight Cut Off (MWCO) of the membrane used. Ultrafiltration is applied in cross-flow or dead-end mode. Water from the treated water tank shall be pumped to ultrafiltration system and stored in the recycled water tank.

Final effluent will be stored in a collection tank and undergo ultra-filtration for reuse such as gardening, floor washing, flushing, dripping in the urinals etc.

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500 CMD Sewage Treatment Plant

Disinfection system consists of chemical dosing for the complete deactivation of any harmful microorganisms in the water. If it is required, two stages of chlorination will be done for the effective disinfection of the treated water. Disinfection shall be done using sodium hypochlorite solution. After adding hypochlorite into the filter feed tank, a predetermined time will be provided to make enough contact time for the disinfectant to deactivate the microorganism present in the treated water. Post chlorination can be done after the cartridge filtration unit.

9. Disinfection System

The filtration system proposed here is composed of Pressure Sand Filter, Activated Carbon filter and Micron Cartridge Filter. The Pressure Sand Filter, Activated Carbon Filter and Micron Cartridge filter are fitted in Series. Treated effluent shall be pumped to the pressure sand filter first and it will allowed to pass through the Activated Carbon filter followed by micron cartridge filter

8. Filtration System

Out let of the flocculation tank is allowed to remain in the settling tank for a time period and the decanted liquid is collected through a weir arrangement. The separation of the solid from the wastewater is achieved by laminar flow developed in the settling tank. Due to the gravity and heavier size of the flocs, it will settle down at the bottom of the settle tank leaving clear water on the top of the settling tank. Over flowing water through the weir will be let into the filter feed tank and the sludge settled at the bottom will be drained to sludge drying bed.

Tertiary Settling Tank

A mild dose of coagulant will be used for the production of larger flocs from the suspended impurities and other organic matter present in the water coming from the secondary settling tank. Thorough mixing shall be attained using air which will enhance the effectiveness of flocculation. Over flow from the flocculation tank will be channeled to the Tertiary Settling Tank.

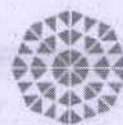
Flocculation

Chemical treatment system includes flocculation and settling.

7. Chemical Treatment System

Out let of the aeration tank is allowed to remain in the settling tank for a time period and the decanted liquid is collected through a weir arrangement. The separation of the solid from the wastewater is achieved by laminar flow developed in the settling tank. Due to the gravity and heavier size of the flocs, it will settle down at the bottom of the settle tank leaving clear water on the top of the settling tank. Over flowing water through the weir will be let into the flocculation tank and the sludge settled at the bottom will be drained to Sludge Drying Bed.

Secondary Settling Tank



Make
L. Ultra Filtration System

= e-dose/UKL/Blackstone/Eqvt.

No. off
No. of Ultrafiltration Membrane

1 Skid
3 (Qua)

Pump

2

Discharge

=

25 m³/h at 30 m head

Material of Construction

=

SS

Type

=

Cross Flow

Valves

=

Pneumatic Control Valves

Control Panel

=

Mimic panel for automatic operation

O. Piping Work

One lot of PVC pipes with fitting and PP valves required for the above work

P. Electrification Work

One lot of Cables, Isolators, starters, control panel etc.

Certified that this report has been prepared for the submission at pollution control board
office for obtaining the consent to operate.

Thanking You.
Yours Faithfully

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Environmental Consultant

Thrissur - 03
28-11-2018

500 CMD Sewage Treatment Plant



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