Scheme of Sewage Treatment Plant:

In the project, the generation of wastewater will be about 1088 KLD. The generated sewage will be treated in in-house Sewage Treatment Plants of total 2500 KLD capacity. The STPs shall be based on Moving Bed Bio-Reactor (MBBR) technology.

RAW SEWAGE CHARACTERISTICS

Flow	m3 / day	1088 KLD
pH	-	7.5 – 8.0
BOD	mg / l	200 - 350
COD	mg / l	400 - 500
TSS	mg / l	100
Oil & Grease	mg / l	10

The Sewage Treatment Plant (STP) shall treat the sewage & treated water of the STP will be reused for Flushing, Gardening & Misc. purposes.

TREATED SEWAGE CHARACTERISTICS

pH	-	6.5-9.0
BOD	mg / l	<10
COD	mg / l	<50
TSS	mg / l	<20
Oil & Grease	mg / l	NIL

TREATMENT PROCESS:

It is proposed to treat the complete wastewater in a scientific manner through a properly planned treatment plant. The objective is to stabilize the decomposable organic matters present in sewage so as to get an effluent and sludge having characteristics which are within safe limits. To have an efficient treatment system, this aeration system is proposed consisting of MBBR Technology. The sewerage treatment plant can be constructed in such a way that it becomes viable by providing Treated water for reuse and sludge that can be used as for manure for further use.

Different Components of the Plant

In the proposed treatment scheme, the following component unit shall be provided:

- Screen chamber
- Bar screen /Grit chamber within effluent collection sump
- Submersible type raw effluent re-lift pumps
- Equalization tank
- MBBR tank/ Aeration tank
- Tube settler
- Clarified Water, Filtered Water & Soft Water Storage Tanks
- Filter feed pump
- Tertiary Treatment Units (Filtration, U.V treatment)
- Treated Water Supply Pumps
- Sludge return pump

- Sludge holding tank
- Centrifuge for solid waste management
- Sludge loading pumps
- Sludge drying beds, Centrifuge/Filter Press

PROCESS DESCRIPTION

a) Raw sewage from main sewer line shall be collected through gravity pipes into the screen chamber. This manually cleaned screen shall be provided to remove floating and big size particles which may otherwise choke the pumps and pipe lines.

b) After screening, the waste water will be allowed to pass through a grit chamber to remove the grit material. The screens and grit chambers shall be accessible so that they may be manually cleaned from time to time.

c) The screened waste water from the Grit chamber shall then pass into the equalization tank to homogenize the waste water quality and also even out flow fluctuations and feed waste water of uniform quality at constant rate to subsequent treatment units. Air mixing shall be provided to mix the contents of the equalization tank. A coarse bubble aeration grid should be provided to mix the contents of the equalization tank and also to avoid septic conditions in the tank. From the equalization tank the wastewater will be pumped into an MBBR Tank.

d) The MBBR process uses small plastic carrier elements to provide growth sites for bacteria attachment in a suspended growth medium. The carrier elements shall allow a higher biomass concentration to be maintained in the reactor. This shall increase the biological treatment capacity for the given reactor volume.

e) The carrier elements shall be continuously kept in suspension by the aeration system. The agitation pattern in the reactor shall be designed to provide an upward movement of the carriers across the surface of the retention screen which creates a scrubbing effect to prevent clogging. Combination of fine & coarse bubbles may be provided to provide oxygen as per detailing.

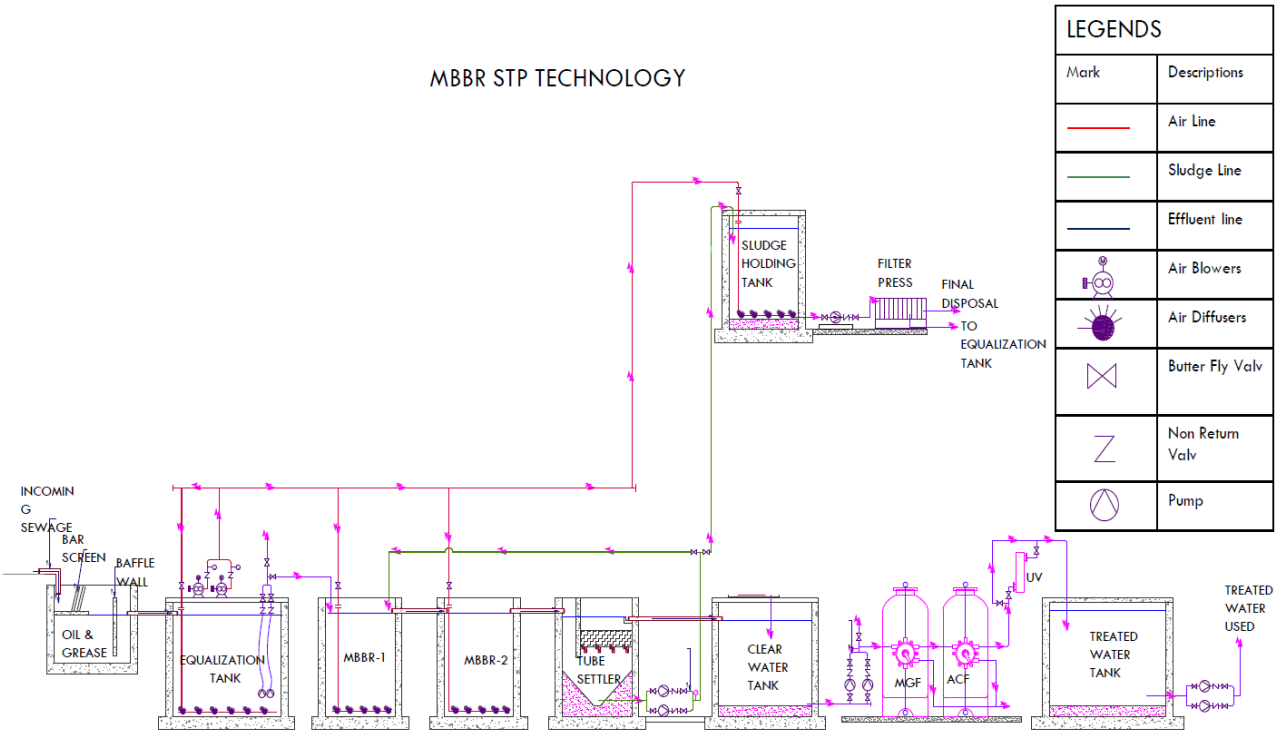
f) From the MBBR tank mixed liquor shall flow by gravity into the Tube settler. The solids will settle in the tank. The sludge that settles down shall be transferred to sludge holding tank via sludge loading pumps, with provision of sludge return to the bioreactor if necessary.

g) From the tube settler, treated wastewater will be fed by means of filter/softener feed pump sets to pass through dual media filters, activated carbon filters and softeners and stored in the filtered water and soft water storage tanks. The activated carbon filters shall ensure removal of all coloration and odours present in the treated effluent.

h) The filtered, clean and odourless water from filtered water tank is then fed through a variable frequency drive hydro-pneumatic system to the external treated effluent rings as per the master plan, from where connections are taken to the garden hydrant system and to each unit for flushing water as per detailing.

i) Excess sludge from the tube settler will be taken periodically into sludge holding tank. In this tank sludge will be aerated for self-stabilization. Air will be shut off periodically and superannuate water will be transferred to the aeration tank creating stabilized sludge. The final sludge shall be de-watered through a centrifuge mechanism. Sludge loading arrangements shall also be provided for direct disposal of sludge to sludge tankers / trolleys.

Hydraulic Flow Diagram of STP based on MBBR Technology

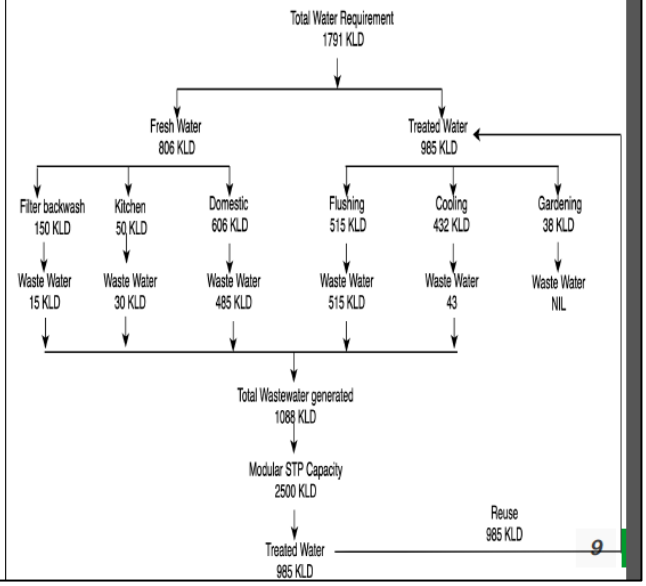


Water Environment & Water Balance Diagram

Construction Phase	
Source	Domestic: Tanker Supply (23 KLD) & Construction: in-house mobile STP treated water (11 KLD)
Operation Phase	
Source	Municipal Supply

Description	Population	Factor in LPCD	Water Requirement (in KLD)	Domestic (in KLD)	FLUSHING (in KLD)
Residential (Service Apartments)					
Service Apartment	400	135	54	36	18
Data Centre/ITES/ commercial					
Staff	18301	45	824	458	366
visitors	6763	15	101	34	68
Facilities- Staff	3000	45	135	75	60
Maintenance Staff	160	45	7	4	3
Sub Total	28624	**Sub-Total**	1121	606	515
		Waste water		485	515
Kitchen			50	30	
Gardening	-		38	NIL	
Cooling			432	43	
Filter backwash			150	15	
Total			**1791**	**1088**	

Water Balance: During Operation Phase



Environment Management Plan Showing Location Of STP, DG Sets, RWH Pits & OWC