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RECYCLING OF SEWAGE WATER FOR APARTMENT.

.Prathamesh Pramod Patil, Aditya Dadaso Desai, Dr. Prof D.B.Desai
Department of Civil Engineering
Shivaji University, Kolhapur
Dr J.J. Magdum College of Engineering.
Jaysingpur, Maharashtra, India

***Abstract*: Recycling of sewage water is most important topic in the world. In most of the areas waste water is thrown off in river and sea without any treatment. This waste water contents many pollutant components that can be harmful for human health and environment. Due to wastewater natural resources of fresh water are polluted and aquatic life is in dangerous. Knowing the importance of water and evaluating the risk makes waste water treatment necessary for avoiding future problem. The purpose of this project is to prevent natural water sources and to treat wastewater coming from human activity and prevent environment and human health. So minimize harmful component present into the wastewater using various method.**

Keywords: **Recycle, Sewage, Waste Water3.**

I. INTRODUCTION

1) Water

Water is a transparent, tasteless, odorless, and nearly colorless chemical substance, which is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living organisms. It is vital for all known forms of life, even though it provides no calories or organic nutrients. Its chemical formula is H_2 O. meaning that cach of its molecules contains one oxygen and two hydrogen atoms, connected by covalent bonds. Water is the name of the liquid state of H_2 O at standard ambient temperature and pressure. It forms precipitation in the form of rain and aerosols in the form of fog. Clouds are formed from suspended droplets of water and ice, its solid state. When finely divided, crystalline ice may precipitate in the form of snow. The gaseous state of water is steam or water vapor. Water move continually through the water cycle of evaporation transpiration (evapotranspiration), condensation, precipitation, and runoff, usually reaching the sea. Water covers 71% of the Earth's surface, mostly in seas and oceans "Small portions of water occur as groundwater (1.7%), in the glaciers and the ice caps of Antarctica and Greenland (1.7%), and in the air as vapor, clouds Since from long man require water for day to day activity, such as drinking. cooking, bathing, washing, e.t.c. From all this activity mostly the water is wasted (polluted). According to LS a human being requires about 135 liters of water per day for his activity & about 80% of this is wanted, means about 108 liter per person is wasted. This Waste Water is generated from various activities such as bathing, washing, cleaning, etc.

2) Waste Water:

Waste water means polluted water which requires treatment for its further use. The treatment may be physical, chemical, biological or combination all. Household wastewater comprises of two types of wastewater as classified below Black water- Wastewater from the toilet, containing faccal matter and urine is called black water. It is also referred to as sewage Grey water-Grey water is wastewater generated from the kitchen sink clothes wash area, bathroom and other taps. Both grey and black water can be suitably treated and reused for non potable applications. Generally waste water contains about 1-5% solid & 95-99% water. The current increase in production & disposal of this waste water has created problems. 3) RECYCLING & REUSE OF WASTE WATER: Approximately 80% of domestic water supplied is released as wastewater. In today's context of fresh water shortage, wastewater needs to be seen as a resource rather than as a waste Wastewater can be recycled and reused for various applications such as for flushing and gardening) Grey water comprises 50-80 % of domestic waste water and it is ceasier to treat and recycle than black water as the contamination levels in grey water are comparatively low. In any application, care needs to be taken to meet IS standards for water quality for the particular application. 4) TECHNOLOGIES FOR WASTEWATER TREATMENT: Besides the conventional treatment systems such as sewage treatment plants (S.T.P) and septic tanks, there are other alternative technologies which can be implemented at the level of a neighborhood or housing complexes which recycle black and/or grey water for reuse purposes such as for flushing and gardening In this project we can recycle the sewage water of selected apartment. Most of the time sewage water is thrown in river without any treatment. This water contents many pollutant components that can be harm full for human health and environment. Knowing the important of water and evaluation the risk make west water treatment necessary for avoiding future problems. The purpose of this project is to prevent natural water recourses and to treat sewage water coming from human

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activity. To prevent environment and human health. To minimize harmful component present in sewage water. In this project recycling of sewage water following method are adopted.

1) Septic Tank

In the rural areas and the fringe areas of sub burden towns an also in case of isolated building and institution, hostels, hotel, hospital, school, small residential colonies underground sewage system with complete treatment of sewage may be neither feasible nor economical. The location of the septic tank should be as far possible away from the building and should not be located in swampy areas and prone to foolding. A septic tank is a combined sedimentation cum digestion tank, where sewage is held for some period when the suspended solids settle down to the bottom. This is accompanied by anaerobic digestion of sludge and liquid which result in appreciable reduction in the volume of sludge and release of gases like. carbon dioxide methane and hydrogen sulfide. The effluent although clarified to some extent will still contain considerable amount of dissolved and suspended putrescible organic solid and viable pathogens which require careful consideration and disposal of effluent. The septic tank sludge may be delivered into a cesspool or into a suitable vehicle for removal from the site it can also be disposal off in the same way as the sewage sludge. Waste water is generated from selected apartment are collect and send towards septic tank for some period. After some time due to sedimentation process sludge are settal down on the bottom of the septic tank And after some time water passed through septic tank with some amount of sludge and send towards wetland system. In septic tank various gases are created like, methen, carbandiaoxide. For relese this gases vent pipe are provided to septic tank. Septic tank are diviaded in three compartment sedimentation 2. Divagation 3.sludge storage. 2) CONSTRUCTED WETLAND Wetlands are transitional areas between land and water. The boundaries between wetlands and uplands or deep water are therefore not always distinct. The term “wetlands” encompasses a broad range of wet environments, including marshes, bogs, swamps, wet meadows, tidal wetlands, floodplains, and ribbon (riparian) wetlands along stream channels. All wetlands - natural or constructed, freshwater or salt - have one characteristic in common: the presence of surface or near-surface water, at least periodically. In most wetlands, hydrologic conditions are such that the substrate is saturated long enough during the growing season to create oxygen-poor conditions in the substrate. The lack of oxygen creates reducing. (oxygen-poor) conditions within the substrate and limits the vegetation to those species that are adapted to low oxygen environments. The hydrology of wetlands is generally one of slow flows and either shallow waters or saturated substrates. The slow flows and shallow water depths allow sediments to settle as the water passes through the wetland. The slow flows also provide prolonged contact times between the water and the surfaces within the wetland. The complex mass of organic and 3) TERTIARY TREATMENT The purpose of tertiary treatment is to provide a final treatment stage to raise the sewage water comity before it is discharged in the river. It includes sedimentation, coagulations, filtration, ion exchange, tertiary treatment. Is used to remove harmful content. In some cases treatment plant add chlorine as a disinfectant before discharging the water in the river. All in all tertiary treatment can remove up to 99% of all impurities from sewage water. But it is expensive process.

INFORMATION FOR DESIGN OF SEPTIC TANK In the rural areas and the fringe areas of sub burden towns an also in case of isolated building and institution, hostels, hotel, hospital, school, small residential colonies underground sewage system with complete treatment of sewage may be neither feasible nor economical. The location of the septic tank should be as far possible away from the building and should not be located in swampy areas and prone to foolding A septic tank is a combined sedimentation cum digestion tank, where sewage is beld for some period when the suspended solids settle down to the bottom. This is accompanied by anaerobic digestion of sludge and liquid which result in appreciable reduction in the volume of sludge and release of gases like carbon dioxide methane and hydrogen sulfide. The effluent although clarified to some extent will still contain considerable amount of dissolved and suspended putrecible organic solid and viable pathogens which require careful consideration and disposal of effluent. The septic tank sludge may be delivered into a cesspool or into a suitable vehicle. for removal from the site. it can also be disposal off in the same way is the sewage sludge. As per IS 2470 (part 1) 1985 Design of septic tank are Prepared. The septic tankdevided in three parts(A) Volume of sedimentation. (B) Volume of Digestion.(C) Volume of sludge storage

Advantages Of Septic Tank

1) The maintenance of the septic system is very economical
2) You need a small space compared to other water treatment systems water quality is obtained
3) people who use it do not have to be highly trained because their systems is simple and easy to operate.
4)It is an excellent option for rural communities, buildings, parks and motels.

Disadvantages Of Septic Tank

1) In some cases, septic tanks may lead to contamination in water which may be used for human use and consumption.
2)Foul odors caused by poor maintenance or clogged septic systems
3)A poorly maintained septic system can be a breeding ground for flies and insects that can transmit infectious diseases that can put in danger you and your family's health.
4)Soil contamination is also another problem that can manifest when poor maintenance is given to the septic system

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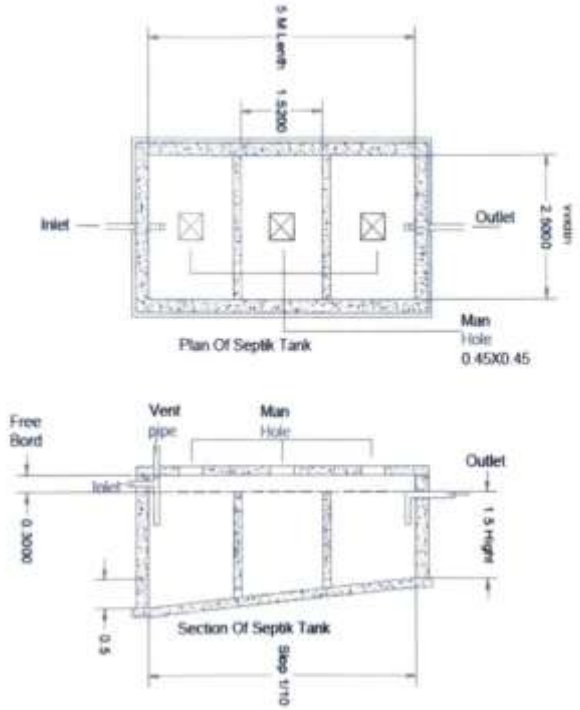
5)There is a risk in rainy seasons that the septic system overflows bringing sewage to the surface



II. PROPOSED ALGORITHM

Anaerobic Waste Treatment Processes:
Anacrobic Waste Treatment Processes Advantage of anaerobic waste treatment systems as means for recovery of non-conventional energy is increasingly being recognized worldwide. Anacrobic decomposition is a biologically mediated process, indigenous to nature, and capable of being similated for treating wastes emanating from municipal, agricultural, and industrial activities Anacrobic digestion as applied in treatment of sewage sludge and other organic wastes, represents the controlled application of a process. Although, anaerobic digesters have traditionally been used for many decades in the stabilization of sewage Budge, their successful and economic employment for the treatment of liquid wastes is only a recent phenomenon, arising from the development of new reactor designs. These concepts have led to development of various reactors, which are capable of retaining a much higher biomass concentration than traditional digesters. Making the sludge retention independent of the influent retention time makes this possible. The technological approaches to allow this condition of independent sludge retention time can be divided in to the following. Attachment of biomass on the media (filters, fluidized systems, and RBC configurations), Non-attached biomass concept as suspended growth process (sludge blanket reactors and contact process with sludge recycling

1) Anaerobic Filter Systems:
The anaerobic filter (AF) and more recent variation of the filter process, the down flow stationary fixed film (DSFF) reactor, are packed with a fixed support media In the DSFF reactor, the biomass is present as a bio film attached to the support media. In the anaerobic filter, most of the biomass is present as suspended und/or entrapped biomass in the interstitial pore volume of the support media

2) Expanded Bed Process In the expanded bed process, the wastewater to be treated is pumped upward avegh a bed of appropriate medium (e.g. sand, coal, expanded aggregate, plastic dia) on which a biological growth has been developed. Effluent is recycled to dute the incoming wastewater and to provide an adequate flow to maintain the sol in an expanded condition
3) Anaerobic Contact Process The essential feature of the anaerobic contact process is that the washout of the ative anaerobic bacterial mass from the reactor is controlled by a sludge sparation and recycles system. The major problem in the practical application of be contact process has always been the separation (and concentration) of the sudge from the effluent solution.

Sewage Discharge
L/M For 50 Persons Sewage water is 108 1/m. For 100 Persons Sewage Water is 216 1/m. Find for 80 Persons? (values takes from IS 2470 part 1 1985) Calculation By Interpolation Method 50-108 80-?
100-216 =108-108-216/100-50X [80-50] =172.8 l/m For 80 Persons.
A.VOLUME OF SEDIMENTATION Consider the peak flow of total sewage as 172,8 l/m for 80 persons. The area require for sedimentation is 0.92*80/10=7.36m^ 2 .dt is provided that 0.92m ^ 2 area and 0.25 meters depth is needed for sedimentation when the sewage inflow rate is 10 liters per minute. The volume needed for sedimentation is 7.36 m^2X 0.25m=1.84 m^3. B.

VOLUME OF DIAGETION Digestion rate for 1 persons. =0.033m (takes from IS 2470 ft1 1985) For 80 Persons Digestion rate is 0.033m^3X 80-2.64 m^3. Area Required is For 1 Persons is 0.92 m^2. - 10 l/m Quantity of sewage are discharge Area Required FOR 172.8 l/m Quantity of Sewage is 15.90 m^2. For Digestion =15.90*0.25 =3.97 m^3. C. VOLUME OF SLUDGE STORAGE 0.00021 m^2 For 1 Day (Takes from IS 2470 part 1 1985) Required For 720 Day (2 YEARS) =720 X 0.00021 =0.15 m^3. VOLUME OF SLUDGE STORAGE FOR 80 PERSONS =0.15 X 80 =12 m^3.

VOLUME OF SEPTIC TANK Volume Of Septic Tank=A+B+C Volume Of Septic Tank
3.97+2.6+12=18.615 m. Hence, the total volume of the septic tank for 80 persons with a sludge clearance period of two year is 18.615m CALCULATION OF LENGTH WIDTH HIGHT

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OF SEPTIC TANK =18.15/1.5 High =12,41 m². Height=1.5m, Length 2 Times of Width Area =12.41= LXB 12,41 =2B X B 12.41=2B² B=2.49m L-2X 2.49 L-4.98m Free Board = 0.3 m. (Assume)

Secondary Treatment Systems Planning and Construction Of Introduction

Constructed wetlands: Constructed wetlands are designed systems to treat wastewater and enhance water quality to be used in many domains. Building constructed wetlands have mainly one purpose which is treating wastewater coming from different resources such as agricultural, domestic, petroleum, aquaculture and seafood processing wastewater. The CWS use microorganisms, plants and soil to treat wastewater. There are many types of wetlands existing for several years and others that are recent or still developing. They can bear growing plants such as sedges, bulrush, reeds and cattail 18 because they can have up to 0.6m depth filled with water. They mainly serve four functions that are enhancing landscape, wastewater treatment, fish farming and enhancing aesthetics of lands. For some cases constructed wetlands are the main and only wastewater treatment, for others they are only a step within a bigger treatment process. Plants usage in constructed wetlands helps filtrating wastewater and absorbing solids in addition to transferring oxygen. CWS have many advantages such as their god ability to remove pollutants (suspended solids and organic matter). In addition, CWs do not need much energy or maintenance cost and they can be adapted to climate change.

Advantages Of Constructed Wetlands

Constructed wetlands are a cost-effective and technically feasible approach to treating waste-water and runoff for several reasons: -

1] Wetlands can be less expensive to build than other treatment options. Operation and maintenance expenses (energy and supplies) are low.
2] Operation and maintenance require only periodic, rather than continuous, on-site labor.
3] Wetlands are able to tolerate fluctuations in flow.
4]They facilitate water reuse and recycling.

Disadvantages of Costructed Wetlands

There are limitations associated with the use of constructed wetlands:

1]Performance may be less consistent than conventional treatment.
2]The biological components are sensitive.
3]They require minimum amount of water

III. EXPERIMENT AND RESULT

1] To select the apartment by visiting contractors, architectures
2] To calculate the quantity of waste water using various text book and IS code
3] To calculate capacity of septic tank using various text book and IS code
4] To design construction wetland for sewage water using various books and research papers.
5] To collect data by visiting various shops and consultant

Various treatment of constructed wetland

1) Horizontal subsurface flow constructed wetlands: Horizontal subsurface flow CWs are similar to Surface flow CWs in using plants for treatment but they differ in the usage of sand and gravel for blocking the bad odor and organic solids that are later dissolved during an anaerobic treatment

2) Vertical subsurface flow constructed wetlands: Vertical subsurface flow CWS are reduced constructed wetlands size and installed filters for second and third treatment. Wastewater treatment in this system is both biological and physical to be used later for irrigation or simply ejected in seas.

3) Hybrid Constructed Wetland: Hybrid constructed wetland are a combination of two systems mainly horizontal and vertical subsurface flow CW. This system takes mainly advantages of both wetlands to increase the performance and enhance pollutant removal efficiency. The hybrid wetland takes advantage of organics, suspended solids removal by horizontal wetland and add to it the contaminants nitrification performed by vertical wetland

4) Forced Bed Aeration: Forced Bed Aeration (FBA) is a new constructed wetland system that is still under development. The purpose of FBAs is to combine advantages of both vertical and horizontal flow constructed wetlands in order to improve the performance of previous existing

IV.CONCLUSION

1) In septic tank due to sedimentation process sludge are settle down bottom of septic tank.
2) In septic tank various gases are formed doe to sewage water and these gases are removed from septic tank by ventilation pipe.
3) Constructed wetland with horizontal subsurface flow have support successfully been used for treatment of domestic waste water the construction of parameters BOD, COD, TSS, TDS, Turbidity, In the influent of wastewater from sewage treatment plant.
4) In tertiary treatment removes colour, odour taste bacteria.

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