International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169
Volume: 4 Issue: 6 286 - 289

Solution for Water scarcity Problem in Construction

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Abstract: These paper is discusses about implementation of sewage water in construction. As per ISI, water demand for residential building is more than commercial building. As we know in residential building water is uses for various things such as for kitchen, bath room, drinking, washing clothes and utensils, toilet flushing etc. Sewage water is the water which collected from kitchen sink, bathroom water which are used for these create a waste. The paper discuses about how we can use that waste water in construction. If instead of creating waste, we are doing recycling of that sewage water and used in construction. If we do recycling of waste water then automatically the demand of water required for construction is automatically decreases. The paper discuses about sewage water treatment with the use of Biosanitizer Ecochips ad its implementation in construction. Also the paper discuses about the experimental research on implementation of sewage water in construction.The paper are discusses the study of effect of raw sewage water and treated sewage water on concrete strength. In ecological approach, ecochips are used for recycling of waste water. Use of treated waste water gives strength to concrete.The paper also discusses the economical point of view for using Ecochips for raw sewage water treatment. These paper has gives guidelines to carry out study of implementation of sewage water in construction field and useful to reduces the water problem in construction field also helps to reduce the total water demand load

Keywords: - *Population, Water Demand, Implementation of sewage water, Construction Field, Biosanitizer Ecological System, Compressive strength of Concrete.*

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I. Introduction:

As we know there are lots of problem with water treatment and also the cost, time and effort required is more. There is lots of water availability problem everywhere. Therefore, it is important to study the implementation of seawage water in construction by ecological method to avoid the problems associated with water availability and its treatment . It is said that there is no such thing as waste, just misplaced resources. In India distribution of water for domestic as well as for industrial purposes are not evenly. Only 50% urban community well under the water distribution network. Only 40-50% water is available to use from total availability of water at the water purification project as remaining is lost in transmission, purification, evaporation and theft. In India only 24% of water connections are metered as the production cost is very higher as compared to the lower level recoveries, also the maintenance cost is very high and due to the limited fund availability, the services are restricted. Water availability at low cost and in large amount from the municipal corporation (0.04p/l).

II. Advantages

1) It is ecofriendly.
2) It is cost effective technique to recycle wastewater.
3) It saves potable water.
4) It can be use in concrete effectively and it gives higher strength.
5) Biosanitizer is a catalyst and it is lifetime investment to recycle wastewater.

III. Biosanitizer Ecochips

Biosanitizer is a natural granular bio-catalyst that has been developed by the Bhawalkar Ecological Research Institute (BERI), using the Eco-Logic. It is kept in contact with water, inside a storage tank or even in a well or bore well. The catalyst has a long working life and uses harmful salts (such as nitrates, phosphates, heavy metals, etc.) as raw materials. Useful minerals and active oxygen is produced during the process. Active oxygen cleans the water, of toxic chemicals (such as pesticides) and pathogens (harmful bacteria and even the viruses). The oxygenated water also has cleansing properties. Use of this water for all its intended purposes, is a simple way to take care of land, water and air pollution [Ref.No.15]

Composition of Biosanitizer

Thousands of plant enzymes are used to make the Biosanitizer ecochips. Approximately 100mg of Biosanitizer = 1acre of biodiversity rich forest.

Functions of Biosanitizer

Biosanitizer is a natural biocatalyst that converts any polluted, dead water into living or bio-water. Its action is based on the ecological principle of utilization of wastes as valuable raw materials, turning them into resources,

rather than separation/ concentration and disposal. Bio-water resists scaling, corrosion, algal growth, befouling, chemical contamination and growth of pathogens/ pests. The key reaction of this product involves production of active oxygen, which can drive several resource-producing reactions. Harmful salts, for instance, become useful minerals.

In nature, coconut water is produced from seawater using a similar reaction. This reaction is used to convert saline/ brackish water into rich mineral water.BIOSANITIZER Ecotechnology has been developed over a period of 36 years, to arrive at an eco-friendly solution to this challenge. It applies to all sorts of waste, chemical/biological, organic/inorganic or solid/liquid/gaseous wastes, too. This approach involves tackling the root cause that produces the waste, in the first place.It is necessary to have study on the problems of water scarcity in construction. Hence the further study is based on above points. Now it is necessary to find the solution for make the water available for construction. In this project is all about the seawater treatment and make sure that it can able to achieve the required compressive strength of concrete which will use in construction. Which will further reduces the load of water demand for construction [Ref.No.16]

IV. Limitations

For Collecting Sewage Water the building should have One Pipe system as to collect the sewage water separately concluded from the case study did at salunkhe vihar, Pune

Methodology for Testing compressive strength of concrete using Treated Seawater:-

LAB WORK

Mix Design for Concrete Grade M40

Data-

1) Grade of concrete- M40
2) Water cement ratio- 0.40
3) Type of cement used- OPC-53
4) Size of aggregate- 20mm
5) Type of sand used- river sand

2) Collection of water-

1) Tap water-It is collected from Hostel Building.
2) Sewage water- It is collected from Residential Building.

C1.Design Stipulation

- Characteristic compressive strength = 40N/sq.mm
- Max. size of aggregate = 20mm
- Degree of workability = 0.8
- Degree of quality =Good
- Type of Exposure =Mild

C2.Test data for materials

- Cement used =PPC
- Specific gravity of cement =3
- Specific gravity
  1. Fine Aggregate =2.8
  2. Coarse Aggregate =2.61
- Water absorption
  3. Fine Aggregate =2.1%
  4. Coarse Aggregate =0.78%
- Fine Aggregate confirming to table 4, IS383-Zone =3 zone

C3.Target Mean strength = 48.25N/sq.mm

C4.Water Cement Ratio = 0.40

Working Of Biosanitizer Reactor

1. Sewage water is collected from the Residential building directly collected to collection tank.

2. Sewage water is then allowed to treat for 24 hours by bacteria present in the tank which absorb all the suspended food particles.

3. Presence of bacteria is due to addition of Biosanitizer which multiply themselves and grow with the help of suspended solids and dissolved oxygen.

4. After the water is treated with the help of Biosanitizer it is then taken out from the outlet which can be used for concreting.[Ref.No.15]

V. Mechanism of Biosanitizer:

Biosanitizer Ecotechnology involves using the Biosanitizer bio-catalyst granules in fluids (liquids and gases) and using the remediated fluid as a resource for healing the ecosystem. Biosanitizer granules convert water into clean water, which also becomes a resource for eco-logical restoration of wells, bore wells, water storage tanks, ponds and lakes. This action can be summarized as follows:

Pollution problems arise due to nitrates. Hence nitrate management is crucial. Low-nitrate systems develop self-healing ability. Inorganic as well as toxic organic pollutants get converted into resources, in low-nitrate systems.

Conventional denitrification technique consumes organic food and oxygen, to produce CO2 and waste heat. Nature prefers another reaction, i.e., combining nitrates, CO2 and waste heat to produce organics and oxygen. Green plants and also the Biosanitizer use this reaction. It is a resource-generating mechanism, while conventional denitrification is a wasteful reaction**.** Hence there are alarms associated with the conventional denitrification process.

Biosanitizer is a natural catalyst; 100 mg of this

product has the capacity of 1 acre of rich natural forest, in terms of its nitrate utilization, CO2 trapping and oxygen production ability.

By adding Biosanitizer in a stream or a reservoir of polluted water, we get not only clean water, but the treated water has a potential to clean the whole ecosystem, without producing any other waste stream and without producing greenhouse gases. In fact, the treated water starts absorbing the CO2 and NOx from the air, thus helping ease the pollution that has increased by about 25% after we started using the fossil fuels.

VI. Data Analysis:

Analysis of Concrete Test:-

RESULTS OBTAINED IN CONCRETE CUBE TESTING

TYPE OF WATER	7 DAYS (KN/M2)	14 DAYS (KN/M2)	28 DAYS (KN/M2)
TAP WATER	22.8	34.5	44.44
RAW SEWAGE	23.82	33.98	38
TREATED SEWAGE BY BIOSANITISER	25.09	35	43

The compressive strength of concrete increase with increase in time. The compressive strength of cube using tap water is 44.44 KN/m2 after 28days .When we use raw water against tap water, strength was reduced to 38 KN/m2, and problem of corrosion also occurs at small extent. Hence to increase the strength to desired level, we use Biosanitizer treatment on raw water.

The cubes made from this treated water gives better results than raw water, it gives strength 43 KN/m2 which is so close to tap water. From the above results we conclude that sewage water can be effectively treated by biosanitizer and can be safely use for construction purpose. Compressive strength increases and water can be effectively use in concrete mixing.

VII. Conclusion:-

The current water condition in the world is very worst and for survival water is must. So, its today‘s need to conserve the water and reduce the total demand for water. There are some mechanical treatment is available for sewage water treatment but those all are not economical and required electricity, chemicals etc.so, now there is need for focus on ecological water treatment. As per the population increases the water demand will be increases and for cope up with the increasing demand of water it is necessary to treat the sewage water for construction. Automatically the total water demand for drinking will be reduced. Also if recycle the sewage water then automatically the problem of waste disposal will also reduces. From the above results we conclude that sewage water can be effectively treated by biosanitizer and can be safely use for construction purpose. Compressive strength increases and water can be effectively use in concrete mixing.

VIII. Acknowledgement:

I owe a debt of gratitude to Prof.Ashish P. Waghmare and Prof. Pranay R. Khare for the vision and foresight that inspired me to conceive this dissertation work. I am particularly indebted to record my thankfulness to our Head of Civil Engineering Department, Dr. D.Y.Patil SOET, Pune.I would like to say special thanks to Dr. Uday Bhawalkar For giving their Expert Advice to me.I sincerely gratitude to all other Professors and staff of Civil Engg Dept who helped me directly and indirectly during this course of work.

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