

# Construction of Magic Soak Pit with Locally Available Materials and Economical Design

Siddhesh Wagh , Amruta Vavale , Vaishnavi Anelli, Ritesh Mahale, Akash Panchal, Unmesh Kalane  
Civil Engineering Department, Aissms Polytechnic  
Pune, India

**Abstract:-** It's a project based on smart drainage system with ground water discharge. These project areas become mosquito free and also of bad water. Second purpose of this project is there is no wastage of money on viruses by mosquito because it is reduced. In this project materials used are boulder, burnt brick bats, RCC tank replaced by plastic tank.

**Keywords:-** Magic Soak Pit, Economical, Efficient, Advantages, Renewed.

## I. INTRODUCTION

A soak pit is an underground structure that disposes of unwanted water, most commonly storm water runoff, by disposing it into the ground, where it merges with the local groundwater. Often called a soak away in the UK, a soak well in Australia and known as a soak pit in India. A soak pit is a covered, porous-walled chamber that allows water to slowly soak into the ground. It is a dry well type of a structure. Water flows through it under the influence of gravity. A dry well receives water from one or more entry pipes or channels at its top and discharges the same water through a number of small exit openings distributed over a larger surface area in the side(s) and bottom of the dry well.

*A. Often people in the rural or urban areas wonder if the construction of soak pit will be beneficial for them or not. The question they always wonder 'How will the soak pit help us?'*

Here mentioned below are few of the advantages studies by us:

- It can be constructed using locally available materials.
- It is very cost effective as it can be afforded everyone.
- It does not require large areas; it can be made in small areas as well.
- It is used where municipal (government) drainage system is not available.
- It also helps in groundwater recharging.

*B. Will the construction of a soak pit affect the health?*

Following are the Health aspects of magic soak pit: As long as the soak pit is not used for raw sewage, and as long as the previous collection and storage/Treatment technology is functioning well, health concerns are minimal. The technology is located underground and thus, humans and animals should have no contact with the effluent. The Soak Pit is located a safe distance from a drinking water source (ideally 30m). The Soak Pit is odourless and not visible it should be accepted by even the most sensitive communities.

## II. YOUR PAPER BEFORE STYLING

- Can be built and repaired with locally available materials
- Technique simple to apply for all users
- Small land area is required

## III. SCOPE

We can implement the Magic Soak Pit through the various schemes of government of Maharashtra like Jalshivar Yojana, Jalswrajya Prkalpa, Bharat Swachatta Abhiyaan (Govt of India) etc. We can implement for individual house in rural areas disposing waste water.

➤ *Construction of magic soak pit with locally available materials and economical design.*

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A dry well is a passive structure. Water flows through it under the influence of gravity. A dry well receives water from one or more entry pipes or channels at its top and discharges the same water through a number of small exit openings distributed over a larger surface area in the side(s) and bottom of the dry well. When a dry well is above the water table, most of its internal volume will contain air. Such a dry well can accept an initial inrush of water very quickly, until the air is displaced. After that, the dry well can only accept water as fast as it can dissipate water. Some dry wells deliberately incorporate a large storage capacity, so that they can accept a large amount of water very quickly and then dissipate it gradually over time, a method that is compatible with the intermittent nature of rainfall. A dry well maintains the connection between its inflow and outflow openings by resisting collapse and resisting clogging.

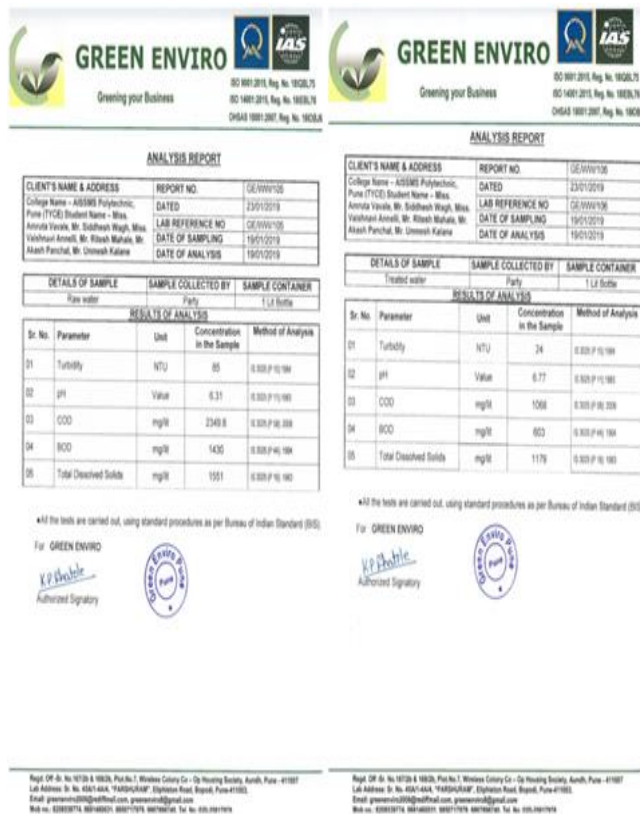


Fig 1

### ➤ Equations

The data mentioned below has the report of the parameters that we tested to proof that the soak pit works efficiently. The parameters tested were pH, Turbidity, BOD (bio-chemical oxygen demand) and COD (chemical oxygen demand), TDS (total dissolved solids)

### ➤ Graphical Representation

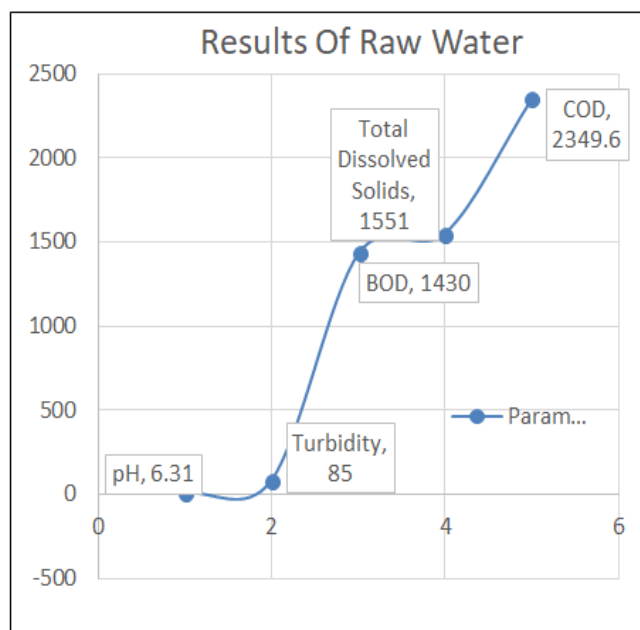


Fig 2

### ➤ Some Common Mistakes

- Primary treatment is required to prevent clogging.
- May negatively affect soil and groundwater properties
- Applicable only where soil conditions allow infiltration, the groundwater table is at least 1.5m below the soak pit, there is no risk for flooding and any water well is in a distance of at least 30m.
- Difficult to realise in cold climate.
- Should be avoided for high daily volumes of discharged effluents.

### ➤ Construction Procedure

- We selected (1x1x1.2) m3 trench which suitable for one family around 5 members and it takes 300 per lit. Discharge in a day and it sufficient for disposing through it.
- Excavation was carried out by manually (or mechanically) depends on size of pit but for making its economical manually prefer.
- The plastic bucket which we used for collecting waste water we made 8 hole on upper side of bucket about 14 mm of diameter.
- After we filled trench by alternate layers of brick bats and boulders with a mesh net in between of size 2 mm, each layer's thickness of cm. The water gets much filtered by this method.
- Filling aggregates about depth 10 to 15 cm after that placed the tank or bucket which used for collecting waste water. Kindly check the height of tank or bucket which should be 15 to 20cm above the ground level.
- Attach the PVC elbow to source pipe and other end pore in tank. Fix the pipe properly and keep cover on tank (we can used plastic cover or steel).
- Cover the pit and make sure that pit will not damage from any external activity and if it possible that construct inside the house for its safety. Process of covering of pit use like that we can open that after some time for its maintenance purpose.
- When we disposed the waste water through magic soak pit it should be treated somehow amount of quality should be increased. Waste water after treated it may infiltrate in to the ground and it will collect the ground water table.
- Hence it is necessary to check characteristic of waste water before treated and after treated.

➤ *Here are the objectives of a good soak pit*

- Study of sanitary situation process in rural area.(Tembhurni, Dist-Nanded)
- To study the advancement the design of soak pit. (Magic Sock Pit.)
- Provision of alternative material of magic soak pit.

A Soak Pit does not provide adequate treatment for raw wastewater and the pit will clog quickly. A Soak Pit should be used for discharging pre settled black water or grey water. Soak pits are appropriate for rural and suburban settlements. They depend on soil with a sufficient absorptive capacity. They are not appropriate for areas that are prone to flooding or have high groundwater tables. Implementation and use of Soak Pit can help in optimizing your local water management and sanitation system and make it more sustainable by:

- Offering a cost-efficient opportunity for a partial wastewater treatment.
- Providing a relatively safe way of discharging pre-treated wastewater into the environment.
- Recharging groundwater bodies.

To study this area we have visited some places where they have already implanted this process for treating water in rural areas. We found some change in design consideration in every places, for making its economical they have used waste materials which easily available in nearby place. This is most necessary to adopt such techniques in such areas for reducing problem creates like zika virus speeded all over Maharashtra and other problems like bad odour.

#### IV. ACKNOWLEDGEMENT

Our project guide Mrs.G.R.Deshpande madam guided us in project work. Green Enviro lab also helped for testing our water samples.

#### V. CONCLUSION

Based on experimented studies we found that this methods of disposing the waste water in rural areas is effective and gives good result of disposing, recharging ground water table, reducing chances of various decease like zika, cholera etc.

Following are the some important concluding points on basis of above experiment and study:

- In rural areas there is no any special treatment plant for treated waste water due to insufficient funds, hence people dispose the domestic waste water through 'Nalhas' in rainy season due to high flood it mix with natural drainage which caused water pollution .
- This is method is effective worked in such situation where no possible to treat waste water, due to its economy it can afford any common family for constructing magic pit in his house. It doesn't require more space for construction and also required less materials and equipment's.
- We treated waste water for reducing characteristic of waste water which produces bad effect to human being as well as animal and courses water pollution. Through the magic pit we can also improve the parameter of waste water and increased quality of water, if we mix the influent in natural water or ground water it will not affect the quality of water it may dilute with water.
- We using local materials for constructing magic pit and used waste plastic tank or any type of container for collecting waste water in pit, and we can use plywood or steel plate instead of concrete flooring then it will economical.
- It requires periodic maintenance about 2 to 3 years and it may take a little effort to cleaning the tank and it has life around 20 to years.

On the basis of this advantages and its simple technics they have implemented various places in all over Maharashtra. Recently in programme of PANI FOUNDATION has declared that through this water cup competition there is village in DHARNI DSRTICT, they have constructed 186 magic soak pit for individual house and they promoting to other people.

We can implement the Magic Soak Pit through the various schemes of government of Maharashtra like Jalshivar Yojana, Jalswrajya Prakalpa, Bharat Swachatta Abhiyaan (Govt. of India) etc. We can implement for individual house in rural areas disposing waste water.

#### FUTURE EXPANSION

At the initiate stage we have consider a single family and studied different parameters of pit. Same process we can adopt for big pit where the discharge of waste water is more only size of pit will increase other process and materials will be same.

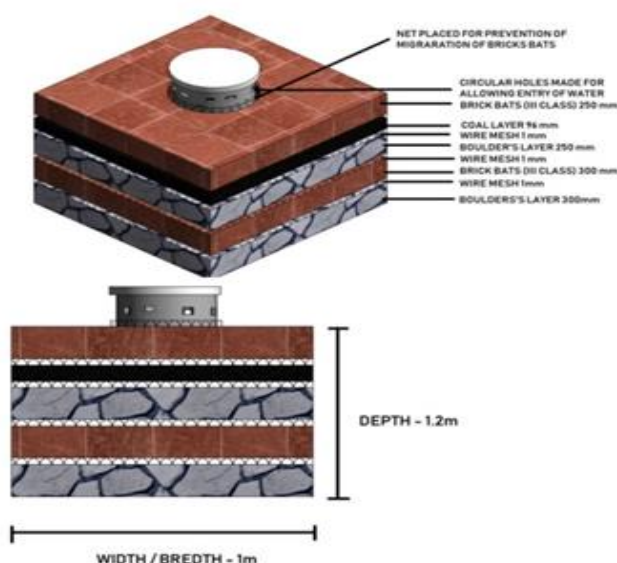


Fig 4:- Diagrammatic representation of layers builds for construction of soak pit

Following are the important points which will consider in future expansion of design parameters of construction of magic pit:

- We can use burn brick and boulders for the materials instead of fly ash which can easily obtain and it will be economical as extra burn brick (class III) normally present on brick kiln and it will not be used in building construction and it is cheap. If we used this in construction of magic pit and it may effectively work then it will make more economic magic pit.
- Efficiency of magic soak pit depends upon the soil present on site and its properties like grain size, coefficient of permeability, infiltration rate and stratification of soil bed etc.
- In further study it will help to find out other considerations and design parameters of magic soak pit.

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