

Availability And Usage of Water In Dit Pimpri: Water Audit

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Abstract- In an educational institute's water is used for laboratory, bathroom, urinals, hostel, canteen, etc. This should need to measure balance of input water to output water. This water proportion is low at the end of the water distribution networks because of the leakages, overflow, and losses through valve. So it is need to water audit of this entire water distribution system. This should save the money to unaccounted water flow and this conserve water used into lesser extent period. An educational institutes need to care about water distribution from start to end. And need to attention at minimum water losses through distribution network.

The study indicates that the unaccounted for water and leaks are responsible for the wastage of water. Preventive measures should be taken for reducing the total UFW. The distribution system should be checked for integrity and leaks from time to time to maintain efficiency of the system and to reduce water losses.

Keywords- Water, Audit, Losses, Leakage.

I. INTRODUCTION

Water audit refers to conducting of periodic exercise to determine water supplied into system as well as water used within the distribution system, it is the qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water audit determines the amount of water lost from a distribution system due to leakage and other reasons such as thefts, unauthorized or illegal withdrawals from the system The cost of such losses to the utility. Elements of water audit include a record of the amount of water supplied and stored by various sources, water consumption, water delivered to unmetered users, water loss and suggested measures to address water loss, waste water generated The goal of an audit is to Express an opinion on the person /organization / system etc., in question, undervaluation based on work done on a test basis. Water audits provide a rational, scientific framework that categorizes all water use in your system. It is a tool to overcome drought related problem, shortage, leakage and losses.

Water Audit comes into picture in late 80s to overcome a drought related problem, shortage, leakages and losses. The goal of an audit is to express an opinion on the person / organization / system etc., in question, under evaluation based on work done on a test basis. Water audits provide a rational, scientific framework that categorizes all water use in your system. It is a tool to overcome drought related problem, shortage, leakage and losses. International Water Association (IWA) / American Water Work Association (AWWA) initiated a large scale effort to asses reduced above related problem with the help of audit. Water audit is most effective tool for water management. With the help of water audit, we identify and quantify what steps can be taken to reduces water use and losses. Water audit and its analysis which can solve not only many water related problem but also saves precious resources and public money. Just as business routine, bank prepares statement of debits and credits for their customers and provides a statement of money, which is flowing into and out of accounts. The water audit displays how quantity of water flows into and out of the distribution system and to the customer. Yet, as essential and commonplace as financial audit is to the world of commerce, water audit has been surprisingly uncommon in public water supply throughout most of the world.

II. OBJECTIVES

1. The utilization of water must be proper and efficient.
2. To check whether the total quantity of water available is sufficient for daily usage.

III. STUDYAREA

We are going to study the availability and usage of water in Tower A DIT Pimpri. It is an educational building having G+8 stories and one basement. There are some labs on first three floors having different water fixtures. Each floor is having two W/C units for GENTS and LADIES. There is one more additional W/C unit, this unit is kept close for some reasons, and there is no usage of water here, so data collection from this unit is not done. There are water coolers are present

for drinking purpose on ground floor, 1st, 2nd, 3rd, 4th, 6th, 7th and 8th floor.



Fig1:StudyArea

IV. AUDIT OF TOWER ADIT PIMPRI

We are going to study the availability and usage of water in Tower A DIT Pimpri. It is an educational building having G+8 stories and one basement. There are some labs on first three floors having different water fixtures. Each floor is having two W/Cunits for GENTS and LADIES. There is one more additional W/Cunit, this unit is kept close for some reasons, and there is no usage of water here, so data collection from this unit is not done. There are water coolers are present for drinking purpose on ground floor, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th floor.

There is regular supply of water, two times every day in morning and in evening. Water is stored in the underground water tank, there is one UG water tank, having three different units

“Flushwater”, “Fire storage” and “Drinking water”. This water is helpful for recharge of overhead water tanks also helps in case of shortage of water. This UG water tank is used for whole premises consists of 5 building. Tower A is one of them. Tower A is having 4 Overhead tanks having **50000 lit** capacities each. This tank is also separated in three unit’s Flush, Drinking and Fire water. For fire security (Capacity-50000 litre), for utility purpose 3 tank Capacity-50000 litre each), for drinking purpose: 15000 litre water pump from underground water tank, Pipe type: GI pipe. There is drinking water coolers present each having a capacity of 150 lit. Overhead water tank is filled twice a day to fulfill total water requirement for one day.

V. METHODOLOGY

The audit is doing by this procedure.

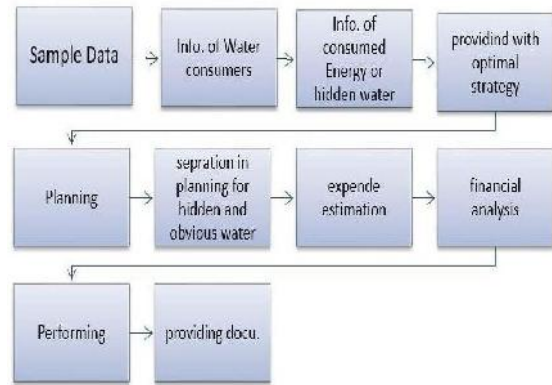


Fig2:Methodology

THE PRELIMINARY DATA COLLECTION

- Water inlet :2 corporation pipe line connection 1” inch (2 water meter
- Bore well: 1
- Underground water storage tank: 3
 1. For fire security (Capacity-100000 litre)
 2. For utility (Capacity-150000 litre)
 3. For utility (Capacity-150000 litre)
 4. In each storage tank there are 2 motors of power of 3Hp
- Overhead water tank: 4
 1. For fire security (Capacity-50000 litre)
 2. For utility purpose 3 tanks Capacity-50000 litre each)
- For Drinking purpose: 15000 litre water pump from underground water tank
- Pipe type: GI pipe
- SEWAGE WATER TREATMENT PLANT(STP)
- Capacity of plant: 200KLD
- 60000 to 70000 litre sewage water is treated.
- Treated water is used for gardening purpose and for flushing.



Fig3:Hydraulic Pump



Fig4:Underground Water tank

After using tap, if the valve is not properly closed there is continuous flow of water through tap.This will lead to loss of water up to **2.88lit/hr.**



Fig 5: Improper closing of valve

DATA ANALYSIS

We take the discharge and leakages of water in a beaker of 100 ml for a 10 second and then calculate for a per min then for an hour and for a day.

Sr. No.	Location	Fixture	Discharge per min(Litre)	Leakage per min(Litre)
1.	Drinking water cooler	Tap	4.77	0.048
2.	WC (Gents)	Tap	3.45	
		Spray	4.14	0.06
		Commode	5	
3.	Faculty Room	Tap	2.34	0.12
4.	Industrial Fluid power Lab	Tap	1.5	0.045
5.	WC (Gents)	Spray	4.62	0.042

Table: Leakages of water

2. Leakage in taps

Taps are tipping continuously due to some manufacturing defects or due to highly pressurized flow in the pipe this will lead major damage to fixture in future, and water lost too.

Due to tipping of tap water loss up to 3.6 lit/hour



Fig6: Leakage in taps

LEAKAGE OBSERVATION

During all this procedure we observed many leakages are lead to water loss. In some cases it is less and some where it is major. We measured the quantity of water leaked out per hour.

CAUSES OF LOSS OF WATER

1. Improper closing of valve

3. Choke up

There is choke up in basin which leads to block the block in basin which is caused by food particles, grease, etc. and can also be caused by the built up of sediments and scale in the pipe. This will lead to slow drainage, unpleasant odor and health risk.

Due to choke up in sink-water loss up to **7.2 lit/hour.**



Fig7: Choke up

PREVENTIONS:

It is possible to cut the daily water usage by 10-30% after knowing the appropriate measures.

1. If use taps half open, this will reduce the loss of water and some water can be saved.
2. Proper closing of tap should be done. This will also lead to some water saving.
3. We can use hand washed water for flush purpose.
4. Proper measures should be taken for leakages.

We are going to aware every member of this institute about this water loses and excess use of water and giving them appropriate solutions for avoid the excess use of water as mentioned above. And we can inform our maintenance management about the losses.

VI. RESULT

After this practice, the total amount of water stored in overhead water tank is 50000 lit, and daily usage of water is 75000 lit. It means 25000 lit water is extra pumped in a day. Apart from this considering all leakages total water loss per day is 451.2lit.

VII. CONCLUSION

We concluded that the total water stored in the overhead water tank in single filling is not sufficient for per day usage. So need to fill tank twice a day. If we follow some preventive measures regarding proper use of water as mentioned above we can save a large quantity of water.

As water loss is very negligible. It is just 0.5% of the total water. With the help of audit, we conclude that college system is working properly.

VIII. ACKNOWLEDEMENT

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