



KALYANI CHARITABLE TRUST'S
LATE G. N. SAPKAL COLLEGE OF ENGINEERING

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SITE VISIT REPORT ON WATER TREATMENT PLANT (WTP)

Date: 17/10/2022

Day: Monday

Time: 10:00 am

Venue: Nilgiri Bagh, Nashik, Water Treatment Plant Nasik

Name of Coordinator: Prof. A. U. Mankar, Prof. M.Z. Khairnar & Prof. S.U. Pagar

Number of students: 114 students of TE CIVIL



➤ **Introduction:**

The Department of Civil Engineering of Late G. N. Sapkal College of Engineering, Nashik organized one day visit to Water Treatment Plant (WTP) on 17/10/2022 for the Third year student of Civil Engineering (BE) program.

The visit was organized with the prior permission and guidance of Respected Principal Prof. Dr. S. B. Bagal and HOD of Civil Department Prof. R. M. Jadhav. Along with the staff members, students of TE have taken hard efforts and initiative for the visit. Faculty members Prof. A. U. Mankar, Prof. M.Z. Khairnar & Prof. S.U. Pagar of our college accompanied the 65 student of BE civil program for educational visit.

➤ **Objective of visit:**

The main aim of visit is to observe & understand the functions of each treatment unit in detail and how practically they are solving the day to day problem if arises. Mr.Rahul Jadhav Site in charge has briefed the students about Treatment process of water and different treatments units required for it.

➤ **Water Treatment Plant (WTP)**

Water treatment plant (WTP) located at Nilgiri Bagh, Nashik which was constructed and started operating in July, 2015. Total capacity of this WTP is 50 million litres per day (MLD). The 50 MLD WTP is serving the water for the domestic purpose.

At starting Mr.Jadhav gave the basic knowledge about treatment process, they explain to students about that before arriving at your tap, water is treated at the Water Treatment Plant to remove sediment, bacteria, and other impurities. Jadhav sir explained the process from the first step.

• **Water Sources**

Water from the Gangapur Dam flows through 914 mm to 711 mm diameter pipe to Nilgiri Bagh, Water Treatment Plant.

• **Data Collection**

The 50 MLD WTP at Nilgiri bagh operates for 20 h per day and is active throughout the year. The raw water is supplied to the WTP through the gravity pipelines. The process flow chart of the 50 MLD WTP is shown below.

Units of WTP

1. Coagulation
2. Aeration
3. Flocculation
4. Sedimentation
5. Filtration
6. Chlorination
7. Distribution

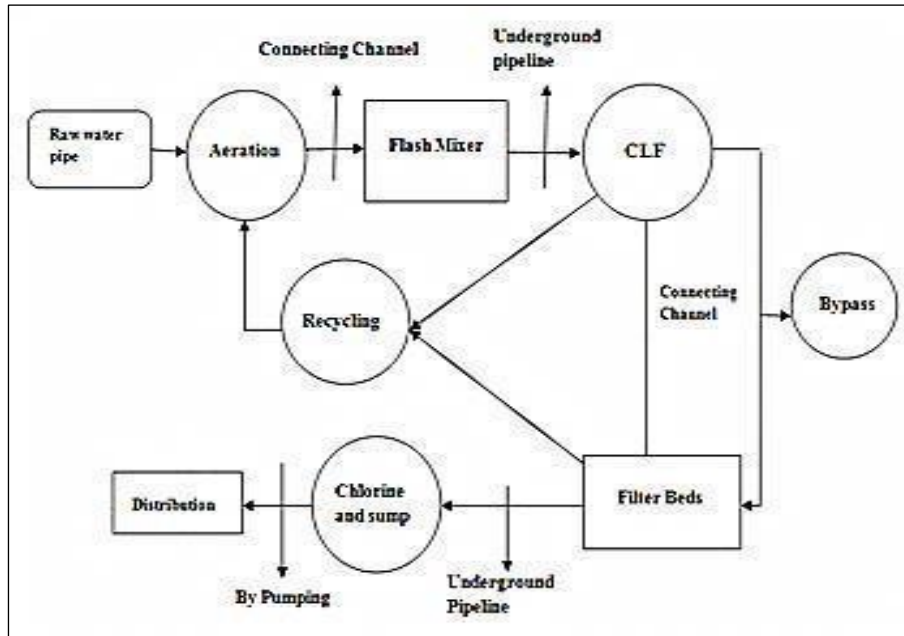


Fig. 1: Process Flow Chart of 50 MLD WTP at Nilgiri Bagh.

1. Coagulation

Once raw water arrives at the plant, the pH is adjusted and water is rapidly mixed with aluminum sulfate (alum), a coagulant that helps the impurities stick together to form bigger particles called floc. Chlorine is also added to water for pre-chlorination process in which bacteria is killed in water.

2. Aeration

Aeration is the process by which air is circulated through, mixed with or dissolved in a liquid or substance. Aeration brings water and air in close contact in order to remove dissolved gases and to oxidize dissolved metals, including iron, hydrogen sulfide, and volatile organic chemicals (vocs).

Aeration is achieved by natural draft units in cascade aerators, which mix cascading water with air that is spontaneously introduced into water flow. Cascade water is pushed to the aerator's top and cascades down through a succession of trays. To achieve iron oxidation and some decrease in dissolved gases, air is naturally introduced into the water flow.



Photo: Cascade Aerators

3. Flocculation

After rapid mixing, the water flows into flocculation basins, where the flow of water is slowed and the floc has time to grow bigger.



Photo: Flocculation Basins

4. Sedimentation

Next, the water flows into sedimentation basins, where the heavy floc particles sink to the bottom and are removed.



Photo: Sedimentation Basins

5. Filtration

Now the water travels through large rapid sand filters made of sand, gravel, and anthracite. Filtration removes any remaining microscopic particles and microorganisms. Backwash water contains the solids removed from the filters, and contractors. The floc particles are separated out in settling tanks and clarifier.



Photo: Rapid Sand Filter Bed

6. Chlorination

Finally, the water is disinfected to protect it against bacteria. chlorine dioxide and a combination of chlorine and ammonia called chloramines used to disinfect the water.

The clean water from the clarifier is DE-chlorinated (removal of chlorine from water) using sodium bi sulphate before it is distributed to villages.



Photo: Chlorine Tank

7. Distribution

The clean water is then distributed from ESR with 50 MLD Capacity by Gravity system into pipes that deliver it to more than 38 Villages.



Photo: ESR with 50 MLD Capacity

➤ CONCLUSION

From this visit, we get the information and practical knowledge about the treatment of raw water and components used in treatment plant. Students got the knowledge about detailed process of filtration process. The visit was nicely completed with group photography at 12:00pm.