



G H Patel College of Engineering & Technology, V. V. Nagar

Department of Civil Engineering

Report on



Water Treatment Plant (Nimeta) and Sewage Treatment Plant (Atladara), Vadodara

Department of Civil Engineering, GCET had organized one day (01/02/19) educational visit to “**Water Treatment Plant (Nimeta) and Sewage Treatment Plant (Atladara)**, Vadodara”. A total of 54 students (3rd year) along with 2 faculty members, Prof. Snehal Popli & Prof. Krunali Patel visited the treatment units.

Nimeta Water Treatment Plant

Nimeta is located 15 km near the city of Baroda, India. Nimeta water treatment plant treats 45 MLD water from Ajwa Sarovar. The treatment plant was explained by the supervisor in detail. The first unit for the treatment process is the sedimentation tank and the flocculator. There were 9 units of Sedimentation Tank and 12 units of flocculator. There were 6 pedals each 6-ft. wide and 22 ft. deep weighing 12 kg in the flocculator. Addition of Alum was only done during monsoon season, otherwise the flocculator works as a sedimentation tank. After the flocculation tank the water reaches to the slow and rapid sand filter tank. There are 06 filter units each 25-ft. deep. The filter unit consists of a fine sand layer, coarse sand level and gravel level each layer 1 ft. deep. There were 4 Rapid sand filters and 2 slow sand filters. In every 4-5 hours, backwashing is done for 30 min. After the filtration process, Chlorination is done. Normally 500 gm chlorine per hour in the form of liquid gas was added. But as the turbidity increases, they increase the chlorine dose. In monsoon, this dose can be increased to 5000 gm per hour. The maintenance work of this treatment plant is done yearly before monsoon and the treatment plant shuts down for 10-15 days for maintenance. There were two other treatment plants lying beside this one having the capacity of 45 MLD.



Visit to Atladara Sewage Treatment Plant

The Atladara STP treats 43 MLD Domestic Sewage waste and then releases the treated sewage in Vishwamitri River. The sewage from the main pumping station comes into the inlet chamber where the bar screen is provided at an angle of 45 degree. The screen removes all the floating matter like paper, plastic bottles, wood pieces, branches of trees etc. which are then disposed directly through a belt conveyor. Then the sewage is entered into the Grit Chamber which consists of pedals moving with low rpm (i.e. slow stirring). When the amount of grit increases, the sewage is taken to the grit classifier and it rotates such that all the grit is collected at one side. After that the velocity of sewage is increased by using parshall flume (10 x 1.5 x 1m). Then the sewage enters into division box-1(2.25 x 3.1 x 0.75m) where further the sewage is distributed evenly in 3 other division boxes for further treatment.

UASB (Up-flow Anaerobic Sludge Blanket) technology is used for the Secondary treatment process of sewage. Here the sewage enters from the bottom of a blanket of sludge where anaerobic degradation of sewage occurs and methane gas that is released through this process is taken to the biogas plant through a pipe and carbon dioxide is released in the atmosphere. Further the sewage is taken to the Pre- aeration tank where the sewage is mixed constantly and the remaining gaseous impurity (<0.01%) is removed. Then it is taken to the aeration tank (52 x 26 x 4m) where the activated sludge is added to the sewage along with oxygen for aerobic degradation. Pedals are provided in this unit for proper mixing of sludge with the sewage and aerated water is passed through surface aerators. There were two aeration tanks with 4 rotors in total.

Further the sewage is taken to the secondary clarifier [42.8(dia) x 3m] where slow stirring is done. The sewage enters into circular clarifier tank from the centre and then is distributed towards the circumference of the tank. Due to the slow stirring, sludge is collected at the centre of the tank and clear treated water is then released in Vishwamitri River. The sludge from the clarifier can be used again in the aeration tank (70%) via return sludge sump [16.60(dia) x 25m] and parts of it is taken to the sludge thickener [6(dia) x 3m] and then to the sludge drying bed (23 x 30m) where addition of chemicals is done and fertilizers are prepared. The Gas holder station [10(dia) x 6m] collects the gas produced from the UASB unit and the gas is used to generate electricity for operating the plant. Various tests like BOD, COD, DO, solids and MLSS are performed before and after the treatment of sewage. The inlet COD of sewage is around 400 mg/L and after the treatment it is around 100 mg/L. Also, the BOD of the outlet after treatment is less than 20 mg/L.

Conclusion: -

We can understand the functions of each treatment unit in detail and how practically they are solving the day to day problem if arises. And we can understand the importance of each components in treatment plant. So, we can design properly. Overall, it was a very informative visit for all the students. The working staff of both the treatment plants was highly cooperative and made maximum efforts to make us understand the concepts lying behind each and every unit very precisely.