



7.1 Institutional Values and Social Responsibilities

7.1.4 Water conservation facilities available in the Institution

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WATER CONSERVATION FACILITIES AVAILABLE IN THE INSTITUTION

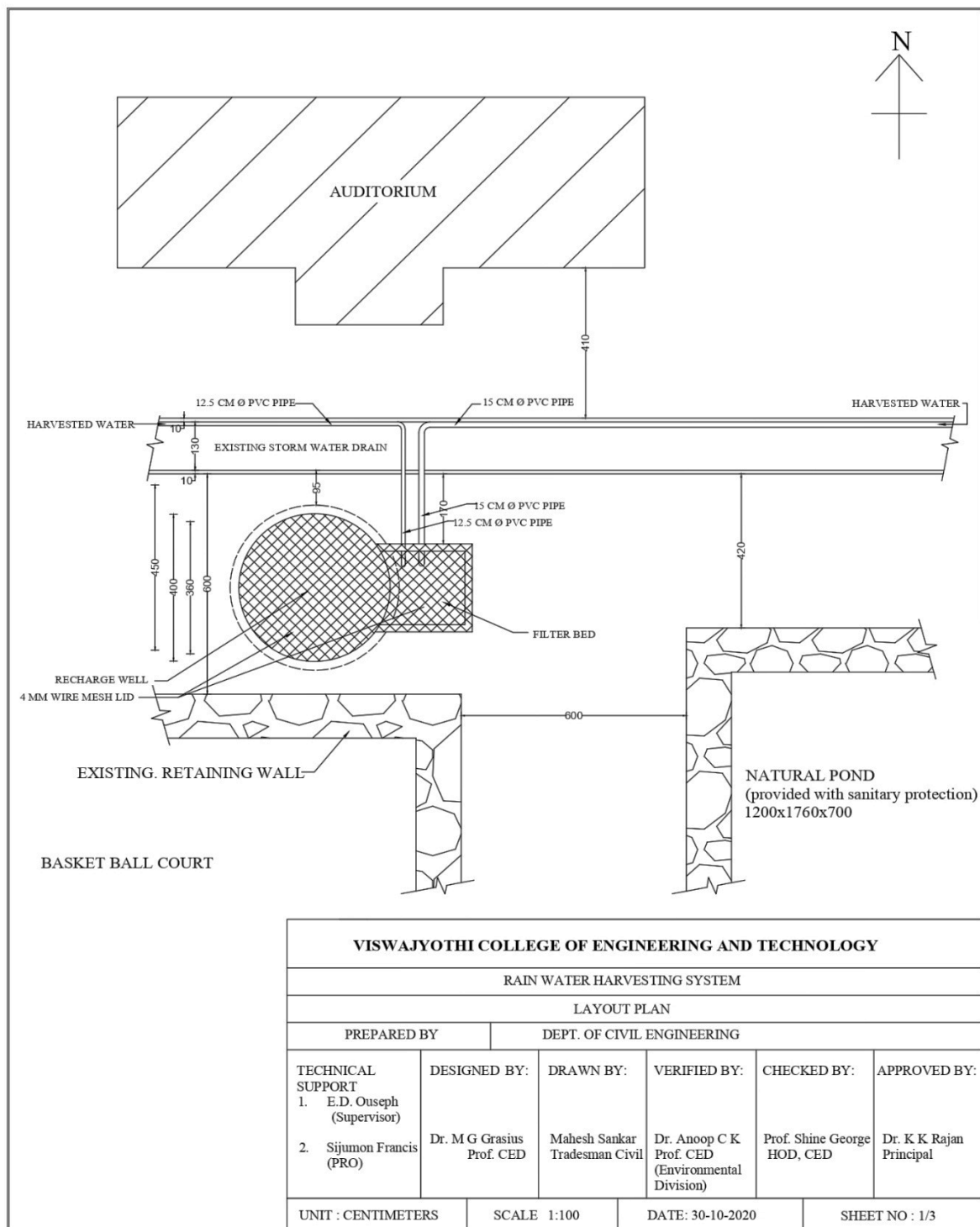
With the ardent desire to preserve natural resources, especially water, the following effective measures are taken in the Institution.

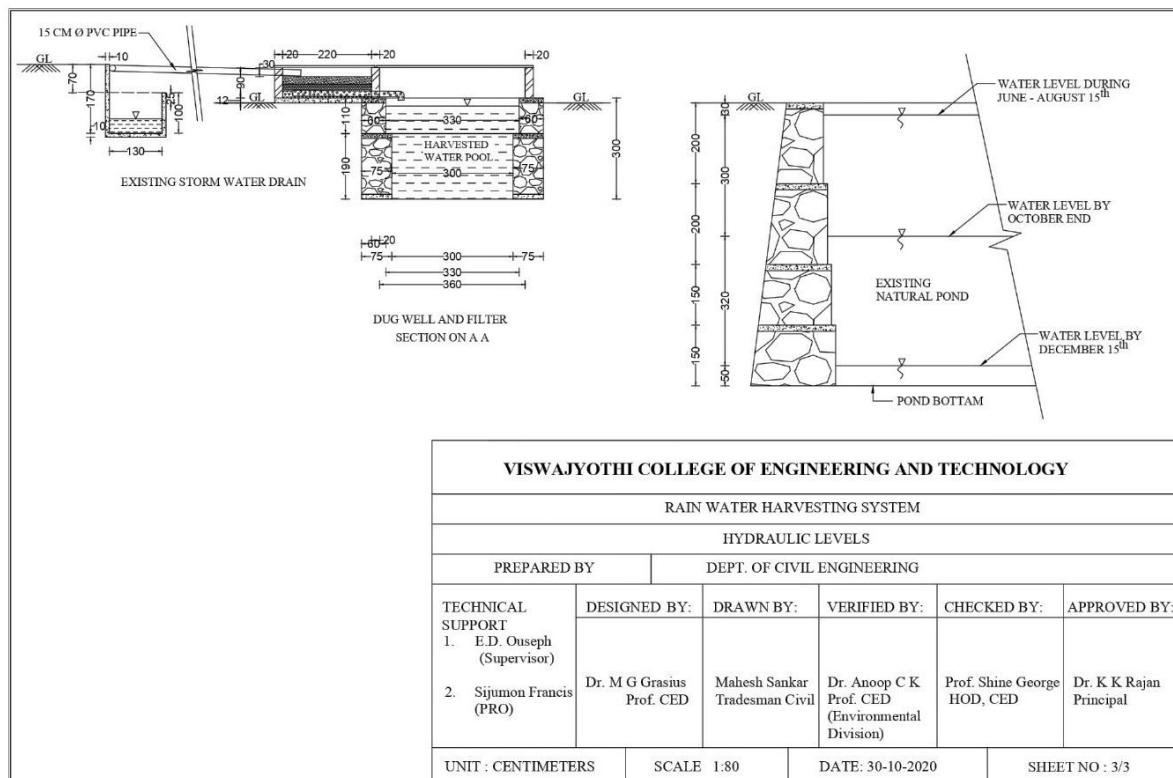
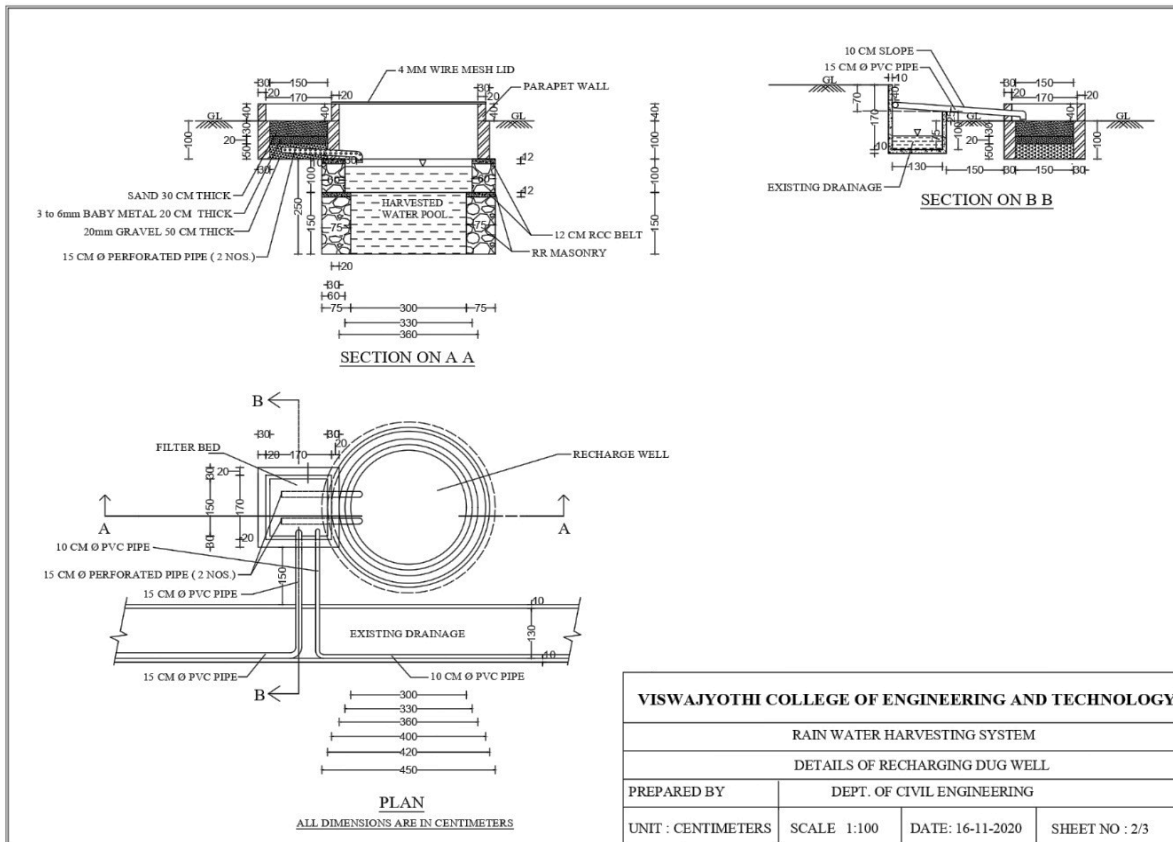
1. Rainwater Harvesting -Recharge Dug well

- The rain water harvested from a roof of area of 1700 m^2 , yielding about 15 m^3 of water per cm of rainfall is charged to a dug well after filtration in a vertical sand filter of $2.5 \times 2.5 \text{ m}^2$ area and 1 m depth.
- The dug well with a diameter of 3 m and depth 3 m (volume 21.2 m^3) is provided with good sanitary protection to avoid any contamination with surface water. The filtered rain water stored in the dug well will recharge the groundwater. This facility is especially useful from August middle to January end every year, during which the ground water flow to the nearby natural pond ($12 \times 17.6 \times 7 \text{ cm}$) will be augmented.
- This natural pond is one of the source well for the campus in which the water level depletes due to the termination of intense **south western monsoon** by the end of August. A rainfall of 2 - 4 cm/hr of 20 - 30 minutes duration occurs 5-10 times every month, from September to December.



Engineering drawings of rain water harvesting system- Dug Well







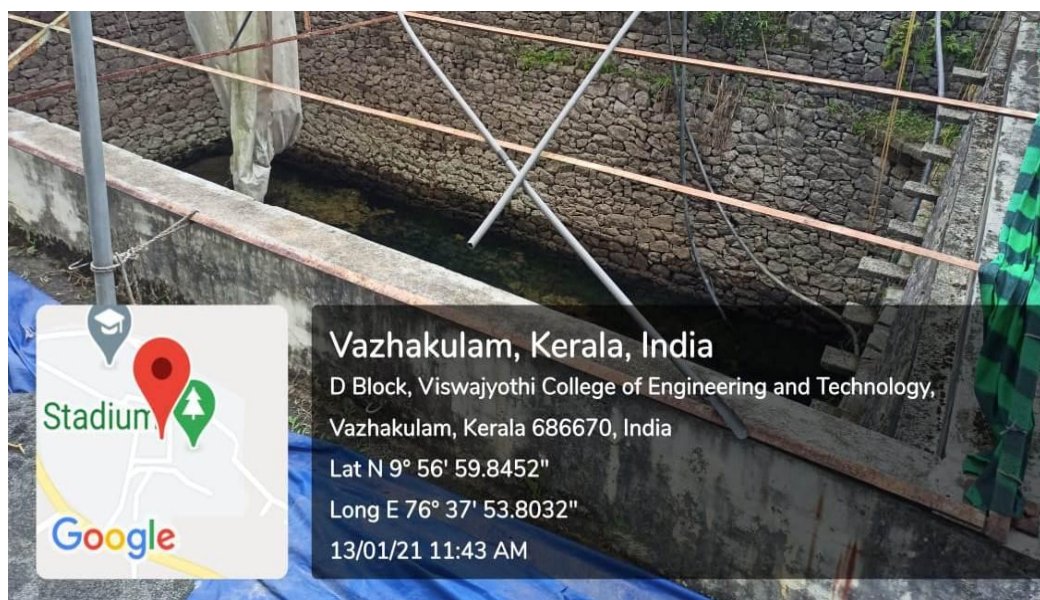
RAIN WATER HARVESTING UNIT



Rain water harvesting system



OPEN WELL RECHARGING SYSTEM



Open Well



2. Rainwater Harvesting Adopting Terraced Construction Techniques

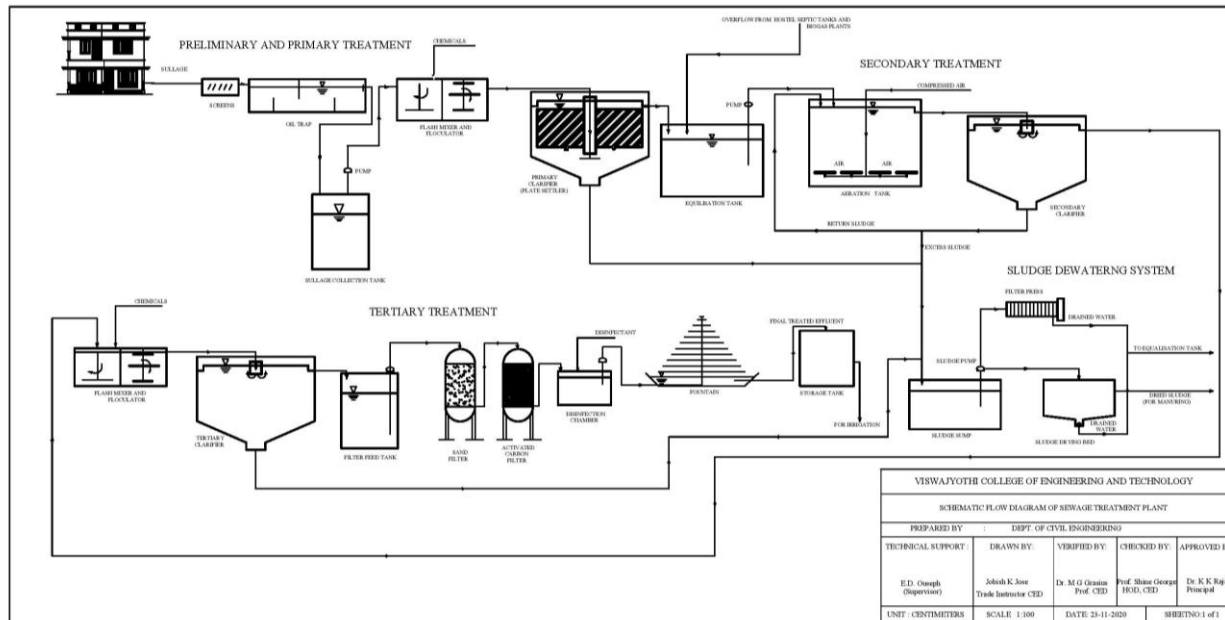
- The development and constructional activities in the campus are made without disturbing the natural ghat terrain.
- All the buildings are constructed adopting terraced construction concepts and mostly done along the contour of the terrace. This prevents loss of storm water through heavy surface runoff.
- Water collected from a total roof area of 4800 m² is permitted to flood in the courtyards of each blocks. This helps in percolation of rain water through soil, thus enriching the groundwater.

3. Wastewater Recycling

- Out of the total possible campus population of about 3100, four hostels accommodate 820 students. The wastewater generated by this population is approximately 180 m³/day (IS 1172-1993).
- The campus has a full-fledged Sewage Treatment Plant (STP) with an installed capacity of 200 m³/day. The treated wastewater emanating from this plant will conform to the Effluent Standards of Kerala State Pollution Control Board for disposal into natural water bodies. However, this treated wastewater is used for irrigating the entire vegetation in the campus of 25 acres area.
- The STP encompasses preliminary treatment like screen, grit chamber, oil separator etc followed by physicochemical treatment. The effluent is then subjected to secondary treatment employing Activated Sludge Process (ASP) effecting substantial BOD removal. The subsequent tertiary treatment provided consists of a second level physicochemical process followed by multy filtration and then disinfection. The SS, COD, BOD, pH etc of the final treated effluent is routinely assessed in the Environmental Engineering Lab of the Civil Engineering Department of the College.



Schematic Flow Diagram of Sewage Treatment Plant



Waste Water Recycling System



Recycled Water Utilization System for Gardening

4. Maintenance of Water Bodies and Distribution System in the Campus

For the campus population of 3100, including 820 hostel inmates, the total water requirement is 220 m³/day (IS 1172-1993). This demand is met with the help of two water sources developed and maintained with at most care.

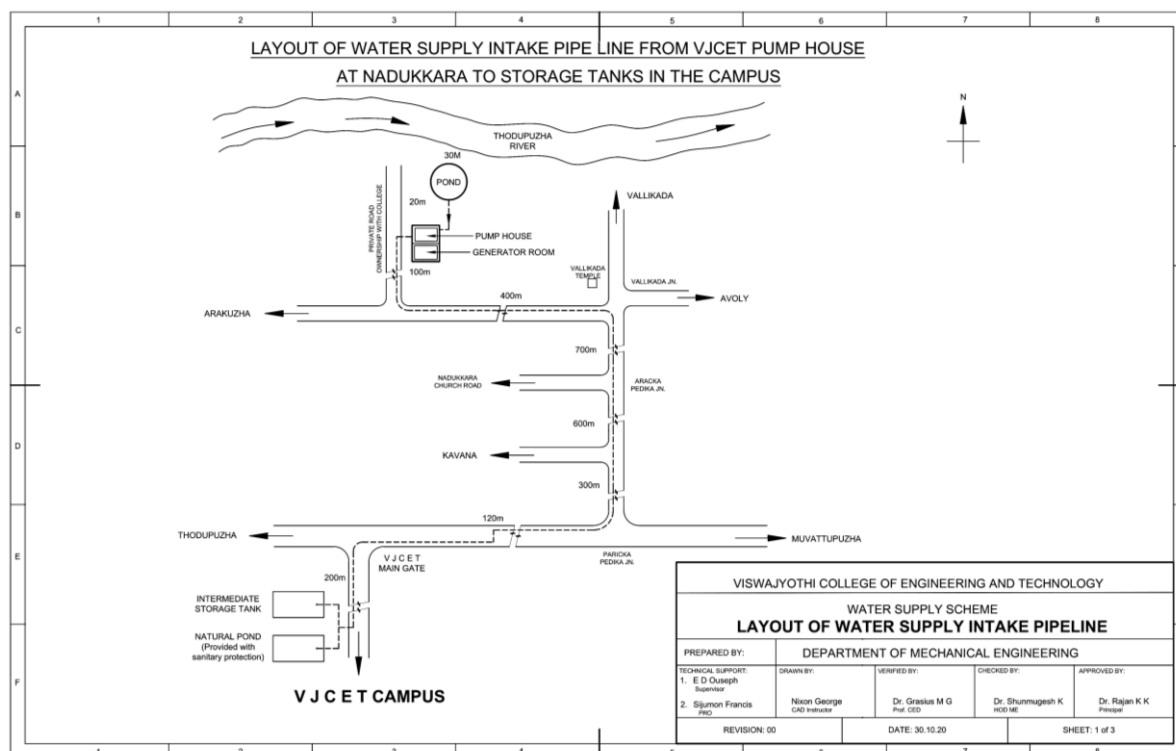
- The first source is a natural pond in the campus itself. All four sides of the pond are protected with dry rubble construction. Sufficient sanitary protection is ensured by providing solid parapet walls all around and required roof covering. This well of size 1200 x 1760 x 700 cm is capable of meeting the water demand of the campus from May middle to December of the year. The well is periodically cleaned and the water quality is regularly monitored in the Environmental Engineering Lab of the College.
- Another water source is at Nadukkara, 2.5 km away from the campus. A dug well of 3 m diameter and 9 m depth is made by the side of the Thodupuzha river and required sanitary protection is provided with. Sufficient water is available in this well to meet the water requirement all through the year, which is 30 m distant from the river. With the help of two 12.5 HP submersible pumps, water is pumped to an intermediate concrete storage tank of 3 lakh liter capacity in the campus.

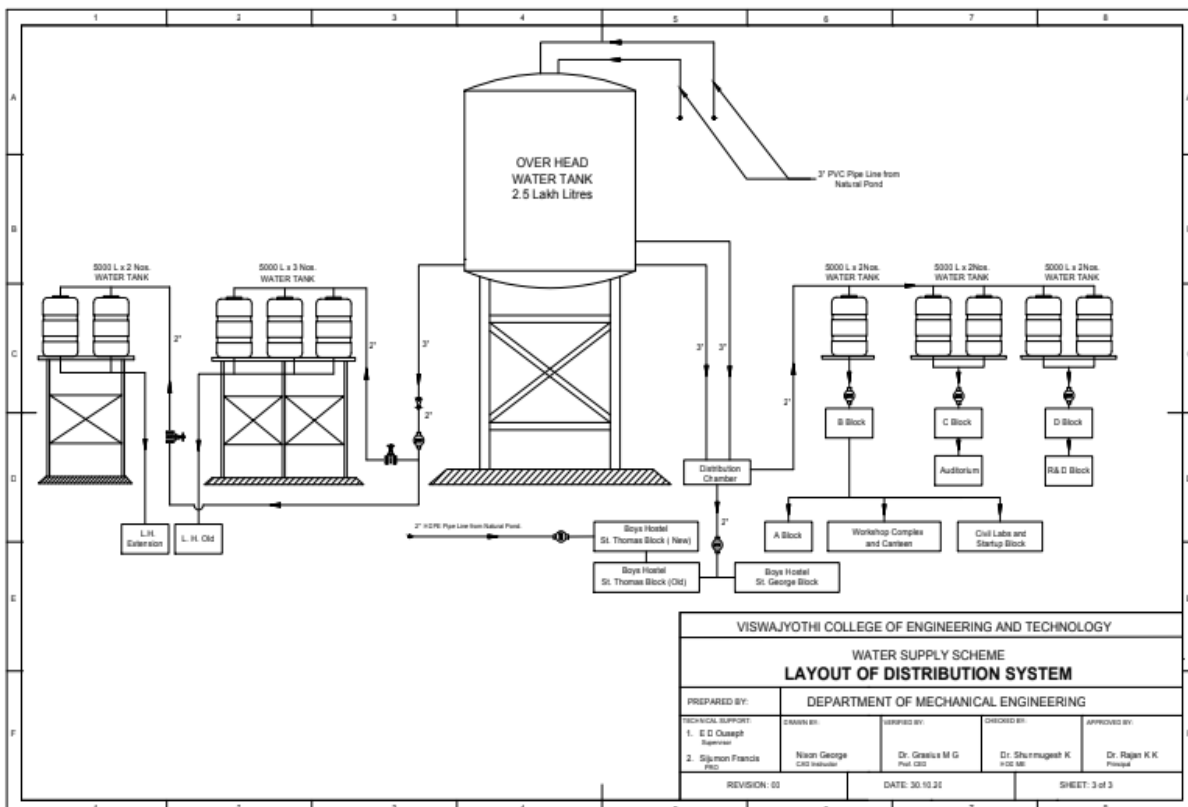
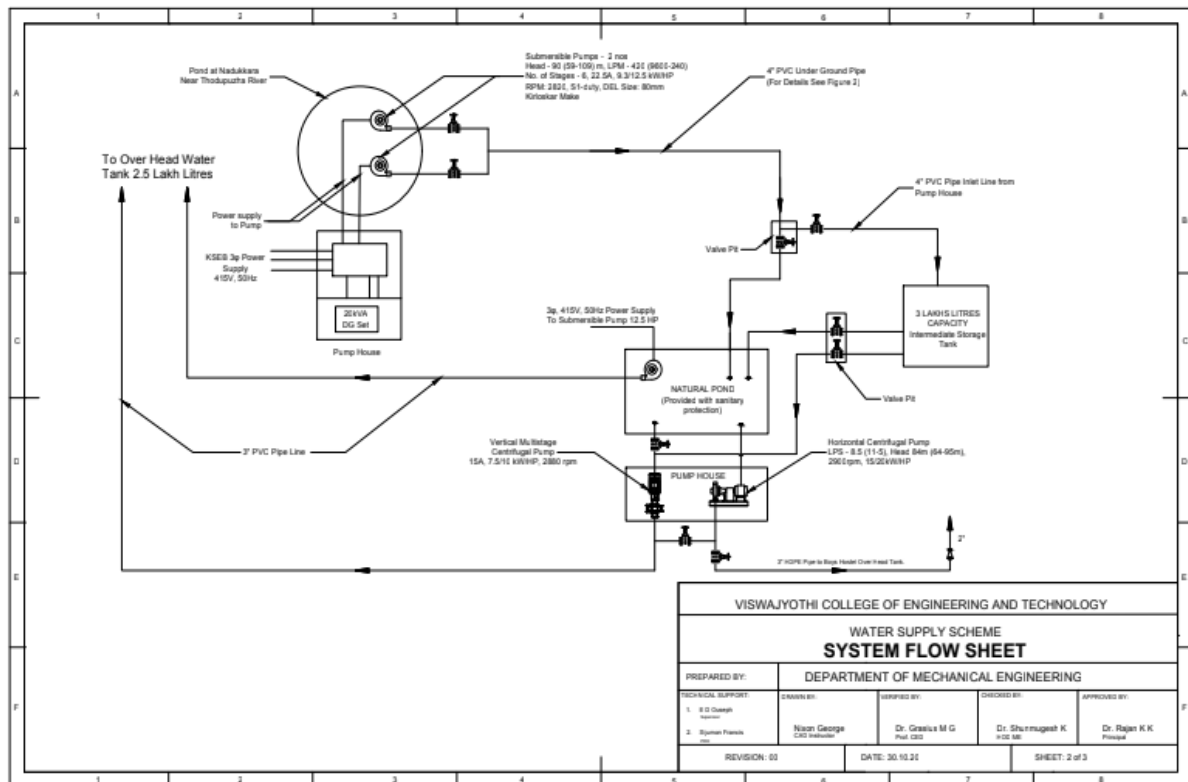
From the above storage tank or from the natural pond, water is pumped to an overhead tank of 2.5 lakh liter capacity from which water is supplied through gravity flow to the entire campus. Flow meters provided at appropriate locations in the distribution



system help in practicing water auditing, as an effective means of water conservation. The water from both sources is of excellent quality and is in conformation with the drinking water quality standards specified by BIS and WHO.

Drawing Scheme Of Water Distribution System







WATER STORAGE TANK



Water Storage Tank



Primary Water Storage Tank



Distribution system in the campus