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(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

WATER CONSCIOUS PLANNING

Introduction

Water scarcity is a pressing challenge both for urban and rural communities in India. However, the urban community very faces explicitly increasing challenges to their water supply because of complex interactions like drought, high rise of infrastructure, population growth, lack of planning, conversion of wetlands, andother natural and human factors. The prospect of climate change adds to the difficulty of planning sustainable water supply systems, on account of the increasing uncertainty about future supply and demand for water and predicted reductions in water availability. As a result, Vel Tech, Deemed to be a University with credentials in academic and voluntary involvement in sustainable development programmes, has enacted several policies and resolutions to create a wide-ranging set of water conservation requirements and water rate structures designed to conserve water.

Protect and Conserve Water

Within the federal sector alone, it is estimated that expenditures for water and sewer run between $0.5 billion and $1 billion annually. Reducing water consumption and protecting water quality are key objectives of sustainable design. One critical issue of water consumption is that in many areas of the country, the demands on the supplying aquifer exceed its ability to replenish itself. To the maximum extent feasible, facilities should increase efficiency by decreasing their need for water. Once efficiency has been optimized, facilities should maximize water collected, used, purified, and reused on-site. Though the collect and treat strategy will do little to reduce the total water volume used on-site, it will minimize treatment and transport losses as well as reduce the overall energy required for processing and conveyance.

Tremendous energy resources are used to procure, pump, heat, treat, transport, and store

potable water. Energy is also used to treat water in the form of sewage. Simultaneously, much water is used for power production, both in the form of cooling towers for thermoelectric plants and evaporation losses for hydroelectric plants. Potentially toxic chemicals are essential to these processes. Using potable water to irrigate lawns, wash sidewalks, or flush human waste is a misuse of this energy-intensive resource. The protection and conservation of water must be considered throughout the life of the building. Facility owners and developers must seek to Use water efficiently through high-efficiency fixtures, elimination of leaks, water-conserving cooling towers, and other actions.

Balance the energy and water conservation strategies in cooling towers through water and air-side economizers and using off-peak cooling as appropriate.

Improve water quality. For example, incorporate storm water settling ponds and kitchen grease-traps, eliminate garbage disposals, and lead-bearing products in potable water.

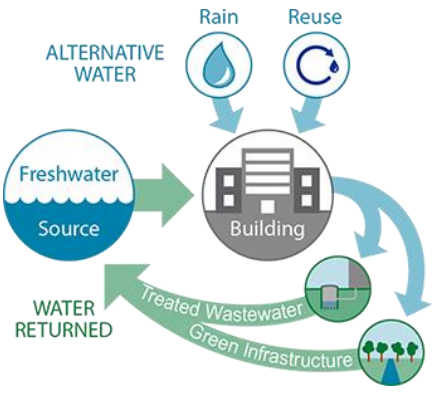
Recover non-sewage and Greywater for on-site use (such as toilet flushing and landscape irrigation, and more generally, consider the water quality requirements of each water use).

Establish waste treatment and recycling centers.

Apply the FEMP Best Management Practices for Water Efficiency.

Follow EPA Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act hydrology requirements to maintain or restore predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

Design for Net Zero Water, which completely offsets water use with alternative water plus water returned to the original water source.



Designing for Net Zero Water

Recommendations

Use Water Efficiently

- Incorporate water efficiency and conservation in construction specifications.
- Use high-efficiency and integrate other water-saving devices into buildings.
- Design a landscape for water efficiency through the use of native plants that are tolerant of local soil and rainfall conditions.
- Meter water usage; employ measurement and verification methods; comply with the Department of Energy's International Performance Measurement and Verification Protocol (IPMVP) for water use.
- Separately meter cooling tower make-up water supply. Ask the local utility if the amount used can be deducted from the sewer water charges.
- Install water-conserving cooling towers designed with delimiters to reduce drift and evaporation, and consider hybrid cooling towers to allow dry-cooling when climatic conditions allow.
- Reduce evaporation through controlled scheduled irrigation that avoids watering during the hottest part of the day.
- Eliminate leaks; caulk around pipes and plumbing fixtures; conduct annual checks of hoses and pipes.
- Commission water and sewer systems as part of the project quality assurance process.
- Specify Water Sense labelled products for quality, water-efficient products.
- Maximize using efficient landscape irrigation equipment such as drip irrigation and soil moisture sensors.
- Initiate water and energy-saving best practices in institutional food services facilities.

Protect Water Quality

- Install and maintain water quality ponds or oil/grease/grit separators as stormwater runoff filtration systems.
- Eliminate the use of lead materials.
- Use non-toxic bathroom and kitchen cleaning products, including products with the Safer Choice label.

Recover Non-Sewage and Grey water For On-Site Use

- Use non-sewage wastewater for irrigation and other uses permitted by the Code or local ordinance.

- Use rainwater, groundwater, and water from sump pumps for on-site activities such as flushing toilets.
- Capture and use condensate from HVAC systems.
- Install a separate pipe system for grey water.
- Follow "Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes", Council on Environmental Quality.
- Work with local water jurisdiction officials to get approval for Greywater projects.

Establish Site-Based Treatment and Recycling Programs

- Use biological waste treatment systems to treat waste on-site.
- Use Greywater, roof water, and groundwater for on-site activities.

Related Issues

Dry Fire Hydrants

A dry fire hydrant is one of the synergistic technologies for achieving water conservation and fire safety. Dry hydrants are non-pressurized suction pipe systems that are permanently installed in ponds or lakes and use untreated water instead of municipal water to fight fires. Utilised in areas that lack conventional fire protection, areas that cannot handle large volumes of water due to antiquated systems, or during peak use seasons when there is low water pressure, dry hydrants allow fire departments to be much more efficient by providing close water sources to fire risks. Since dry hydrants are installed below the frost line and do not require electricity, they are capable of supplying water in the case of natural disasters such as hurricanes and tornadoes when electricity lines are knocked down or during extreme cold or hot weather where conventional hydrant pipes can freeze or break. Also, dry fire hydrants help save drinking water and conserve energy by using rainwater that does not need to be processed to fight fires.

Grey water

Grey water use can significantly reduce the amount of potable water needed for landscaping irrigation, toilet flushing and other non-drinking water applications. To increase Greywater recovery and use, coordinate with local water authorities to explain the value of Greywater recovery and the benefits to them and their community. As of 2014, many jurisdictions will require a variance to source plumbing fixtures with non-potable water.

Passive Survivability

Passive survivability is a reasonably new approach to disaster recovery and continuity of

operations. Ensuring that an on-site water storage system can survive a natural disaster would allow a facility to operate through the disaster or restart operations soon after a disaster.

Extreme Weather

Extreme weather has taxed water supply systems and caused major damage to facilities along coastlines and rivers. Before rebuilding after extreme weather events, apply sustainable development principles to rebuilding water supply systems and storm water management.

Continual drought conditions plague some parts of the country. Design water infrastructure systems and facility water use systems to minimize water use in these areas.

Impact of Waste Water Reduction for Combined Storm and Sanitary Systems

Many older urban areas are left with a legacy of combined storm and sanitary sewer systems, which can easily overwhelm sewage treatment facilities during storm events. Raw sewage may be required to be discharged directly into waterways when such systems are overwhelmed. Reducing water use and recycling Greywater in buildings can help reduce the sewage load on the treatment facilities.

Reduce Electrical Power Consumption

Large amounts of water are used in electrical power production; reducing electricity use will also reduce water at the power plant. Conversely, electricity is used for water pumping, extraction, transfer, distribution, irrigation, manufacturing and wastewater treatment. Reducing the use of water thus reduces the amount of electricity required to be produced by the power plant.

Water Conservation Goals

The primary goal of Vel Tech University is to achieve water neutrality by2025. The University is implementing water-efficient fixtures in its new constructions, ensuring 100% treatment and recycling of sewage and rainwater harvesting. Sewage will be treated using state-of-the-art technologies and recycled in flush tanks and irrigation. Student and staff engagement plays a significant role in our water sustainability strategy. Reducing water consumption and protecting water quality shall be the key objectives of Vel Tech Deemed to be University. The institution views water from the three interrelated dimensions of efficient conservation, responsible consumption and restoring and retaining

surface and groundwater.

One critical issue of water conservation is the salty groundwater in many areas on the campus, and the management has implemented standard metering infrastructure and procedures across the campuses. The institution has also got Rainwater harvesting systems in line with the replenishment of water resources.

Fig- 1. Vel Tech students actively involved in Independence Day event 15-08-2023

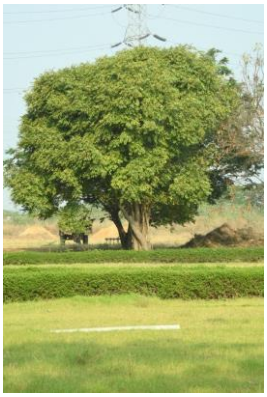


Fig- 2. Drought-Tolerant Plants in the Campus