



CE 3372 WATER SYSTEMS DESIGN

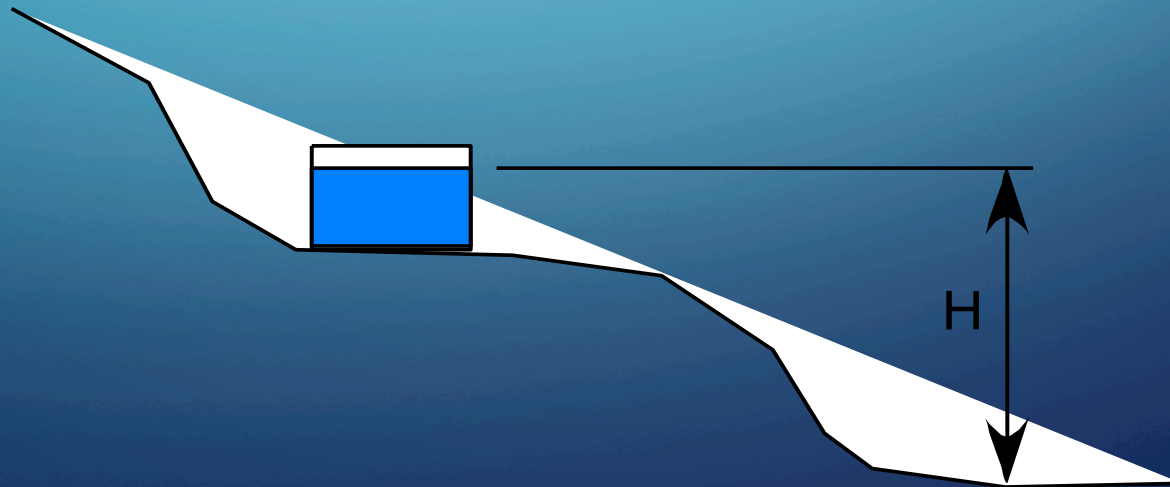
DRINKING WATER STORAGE PART 1 (FALL 2020)

STORAGE

- Storage is used in water supply, storm water management, and wastewater systems for a variety of reasons.
 - SERVICE STORAGE
 - flow equalization — generally things are designed for a particular steady flow rate and storage can be used to accommodate variable flow rates in a system.
 - Pressure zone maintenance
 - EMERGENCY STORAGE
 - used to provide supply during repairs and other system interrupts
 - FIRE STORAGE
 - used to provide supply during fire fighting activities – could logically be considered as part of emergency
- Storage is either elevated (above grade), at grade (reservoir, tanks, ponds, etc.) or below grade (subsurface vaults — NOT AQUIFERS).

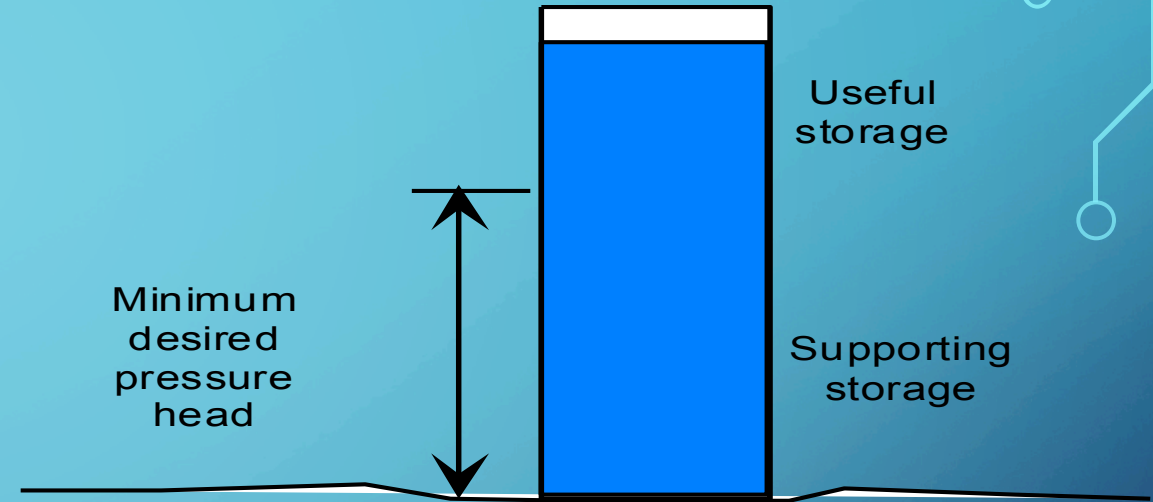
SURFACE RESERVOIRS

- Where natural elevation is high enough
- For inexpensive pumped storage
- Covered for protection (contamination, algae growth, evaporation)
- Good temperature control



STANDPIPES

- Vertical cylindrical pipe
- Height > diameter
- Useful storage = volume above elevation needed for minimum pressure
- Low storage useful for emergencies
- Steel, reinforced concrete



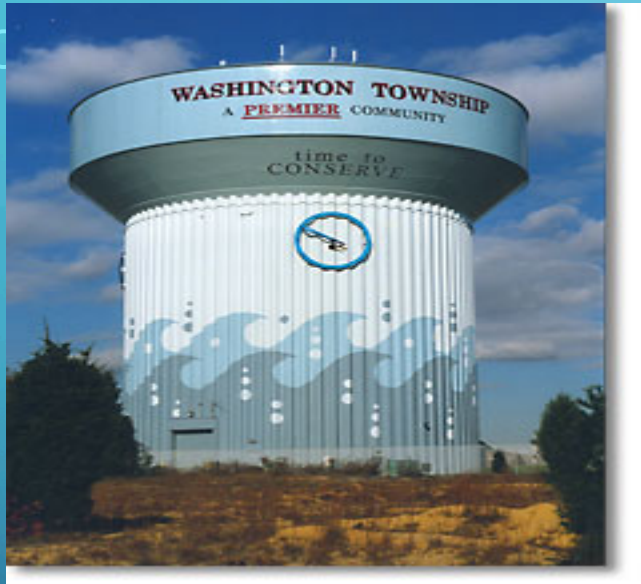
COMPOSITE ELEVATED TANKS



HYDROPILLAR™



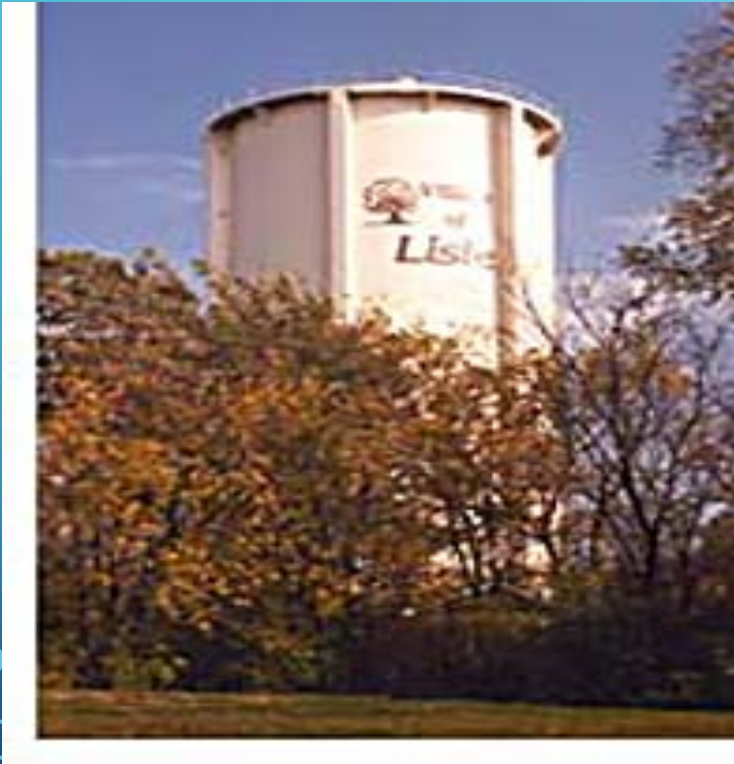
HYDROPILLAR



WATER SPHEROIDS



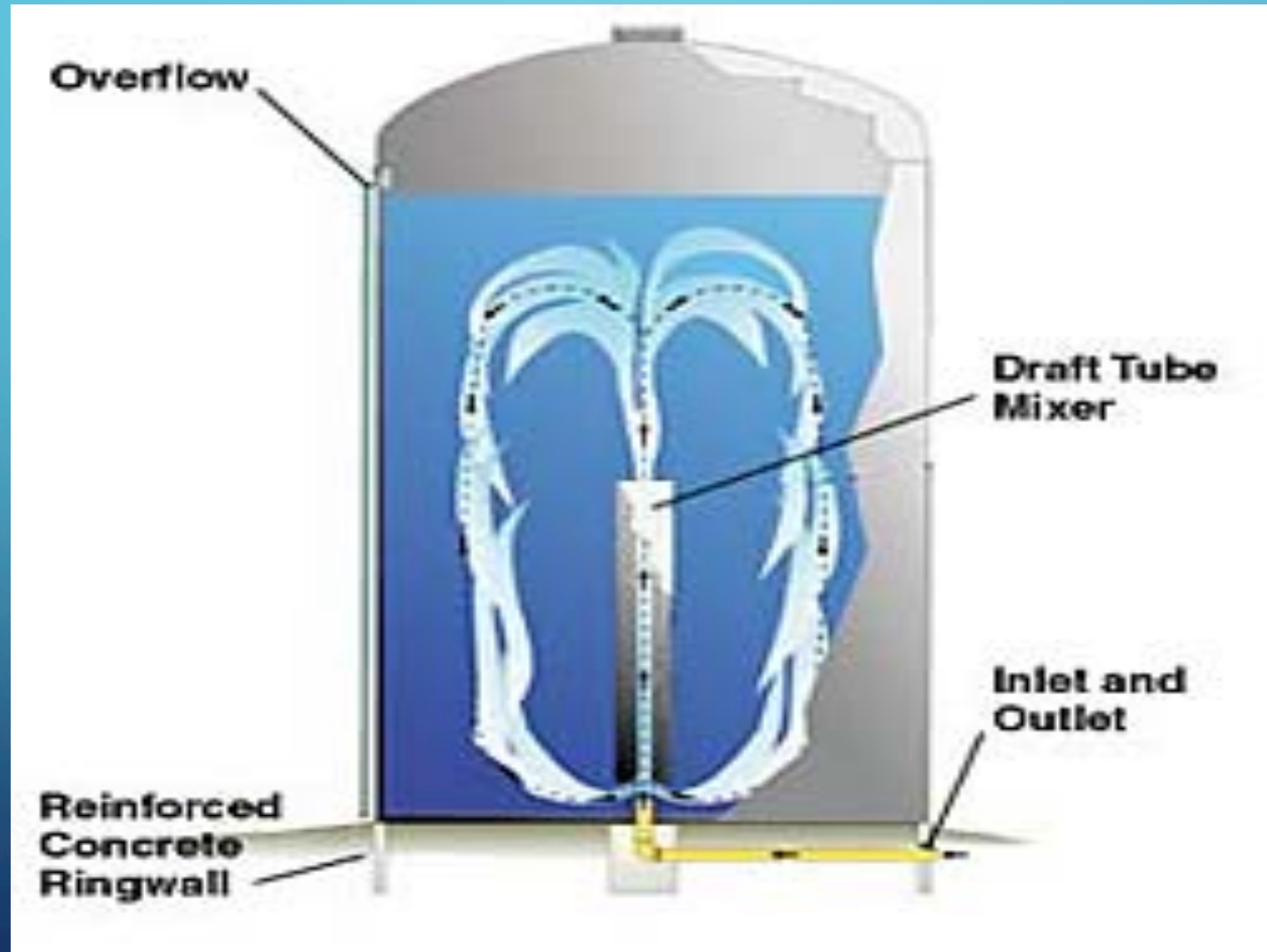
STANDPIPE GROUND LEVEL



STANDPIPES AND RESERVOIRS



FRESHMIX™ STANDPIPE MIXING



COMPOSITE ELEVATED TANKS

Standard CET Dimensions			
Capacity (in U.S. gallons)	Tank Diameter (in feet)	Head Range (in feet)	Pedestal Diameter (in feet)
1,000,000	70	40	36
1,500,000	87	40	48
2,000,000	94	45	52
2,500,000	105	45	60
3,000,000	118	45	64



TYPICAL INSTALLATION

Notice of Public Hearing City of Pharr DWSRF Program Clean Water Tier II Program City of Pharr WTP Expansion Project

Date/Time/Place of Hearing

The City of Pharr will hold a public hearing on **Tuesday, January 21, 2014 at 5:00 PM** in the Council Chambers (118 S. Cage Blvd, Pharr, TX 78577) as part of the regularly scheduled City Council Meeting.

The hearing is to discuss the proposed City of Pharr Water Transmission Main and Elevated Storage Tank Project, alternatives to the proposed project, and their associated costs. One purpose of the hearing is to discuss the potential environmental impacts of the project and the alternatives to it.

Project Description

The City of Pharr (City) is making improvements to the water distribution system to address low pressures in the City's North Region and adding elevated storage to accommodate growth. The improvements include the installation of a water transmission main from the High Service Pump Station (HSPS) to the existing Expressway 83 and LBJ Elevated Storage Tanks. The transmission mains range from 12, 16, to 20-inch and extend approximately 4-miles. A 1-MG elevated storage tank is also being added (Eldora Elevated Storage Tank) at the intersection of Eldora and Dahlia St.

Project Cost and Estimated Monthly Bill to a Typical Residential Customer

The estimated construction cost of the proposed project is approximately \$9.1-Million. The City of Pharr has carefully studied the economic impact of not only this project but



UNDERGROUND “TANK”

- More than a hole in the ground
 - Needs structure to support surface loads
 - Needs a way to drain completely (usually a pump)



Rainstore³ is perfect for water harvesting. two layers of geotextile fabric encase an impermeable liner. A maintenance/access port is shown.

