# Rain Water Harvesting


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# Rain Water

- Rain water contains:
  - No Chlorine
  - No Salts
  - Is low in Ph and minerals
  - Has No harmful chemicals to effect plant root systems

# What is Rainwater Harvesting?

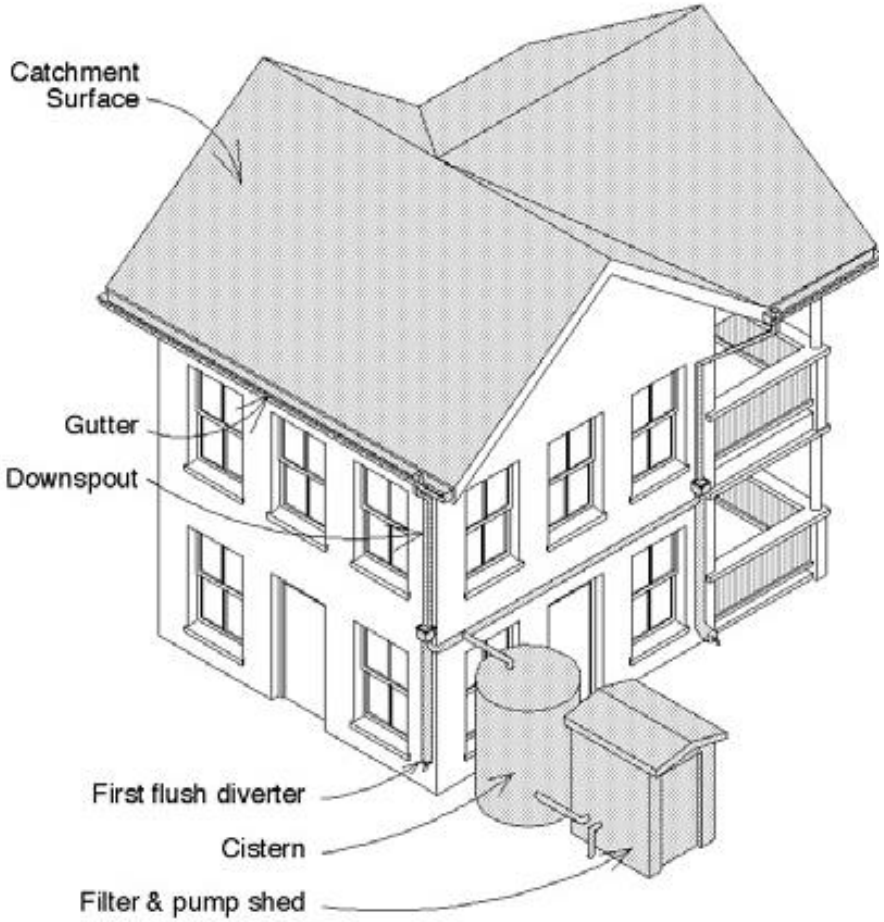
- **Rainwater Harvesting** is the capture, diversion, storage and distribution of rainwater for later use
- Why Rainwater Harvesting
  - Save $$$$
    - Water bill
    - Electric bill
  - Reduces demand on municipal water supply
  - Makes efficient use of a valuable resource
  - Reduces flooding, erosion, and contamination of surface water

# Uses

- Irrigation
  - Landscape
  - Garden
- Pets
- Livestock
- Wildlife
- Firefighting

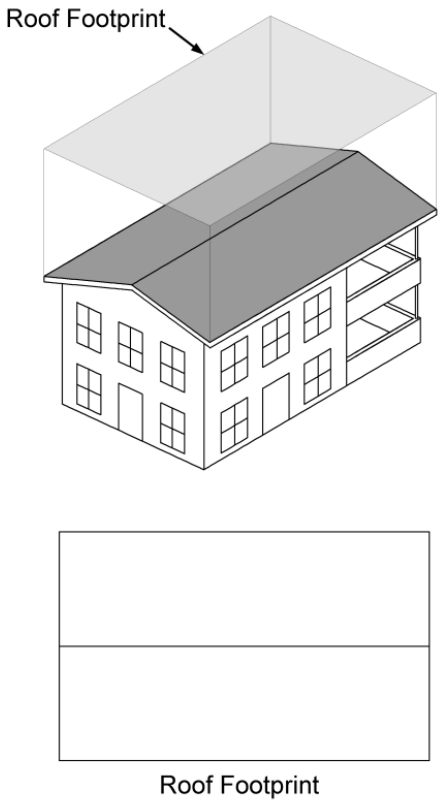
# Rainwater Harvesting Requirements

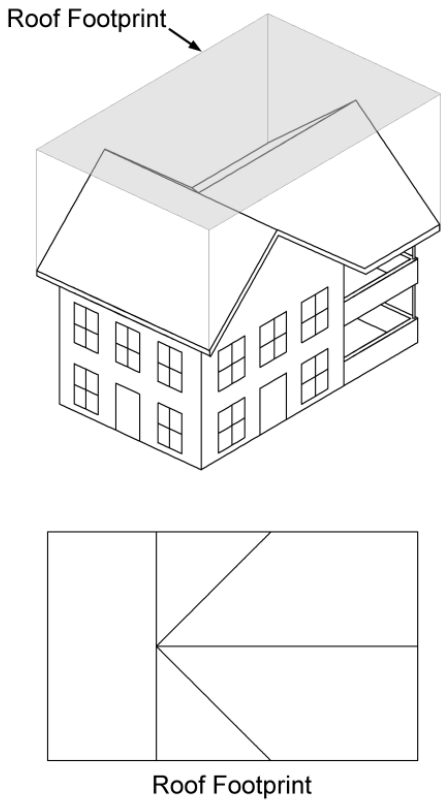
- Consist of:
  - Catchment
    - Foot print of roof
  - Conveyance
    - Gutters and Downspouts
  - Storage
    - Tank
  - Treatment
    - Filtration
  - Distribution
    - Drip Irrigation

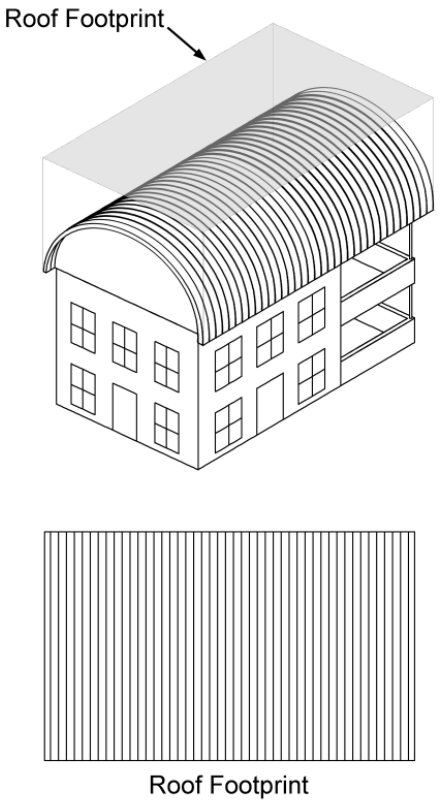


# Catchment Supply

- Footprint of the building



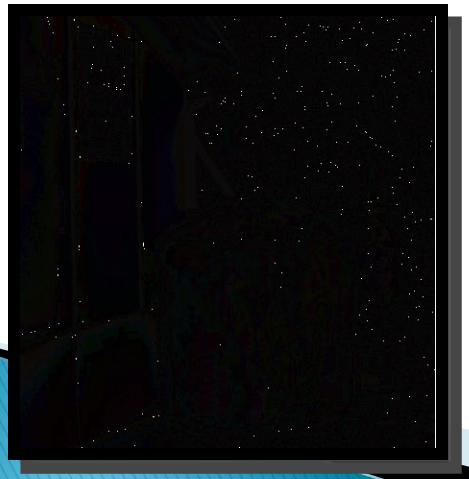



# Rainwater Harvesting System

## Storage

- Containers may be made of polyethylene, fiberglass, wood, concrete, or metal
- underground or above-ground
- Opaque

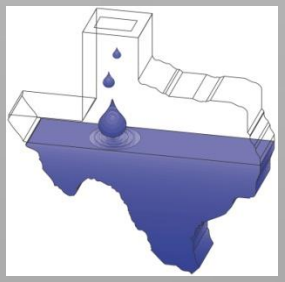


# Rainwater Harvesting System Storage

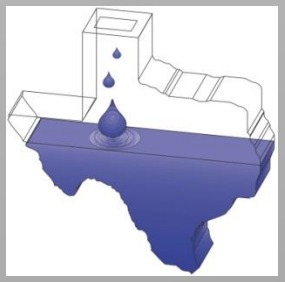
# One Leads to Another

# Rainwater Harvesting System Storage

# Filters for Rain Barrels



# Rainwater Harvesting System Filter



# Wildlife Guzzler

# Poly Cistern Covered with Wood

# Overflow Pipe

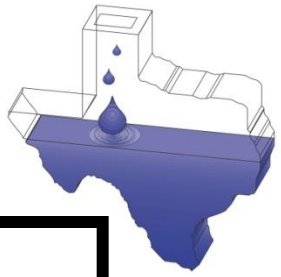
The overflow allows water to run out of the tank when it is full rather than backing up into the gutter

# Design and Build a Rainwater Harvesting System

## Calculate Supply

**SUPPLY (gal) = Rainfall (in) x 0.623 x Catchment Area (sq ft) x Runoff Coefficient**

# Calculating Supply

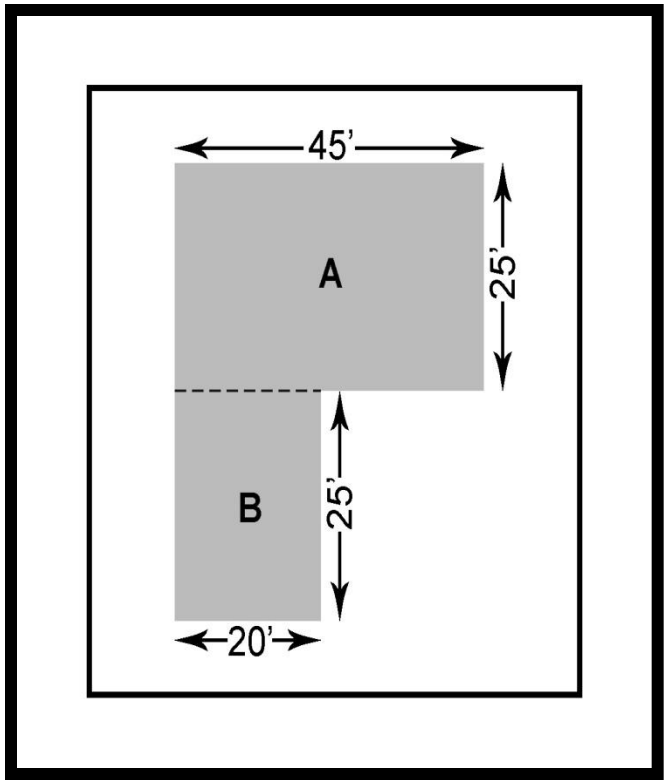


Calculates the catchment area. The eave-to-eave measurements for

section A are 45’ x 25’

section B are 20’ x 25’:

1,625 sq ft of catchment area.




**Rainfall (in) x 0.623 x Catchment Area (sq ft) x Runoff Coefficient = SUPPLY (gal)**

# Calculating Supply

- .6 gallons per square foot roof per 1” rainfall
- 2,000 sq. foot roof X 1" rain = 1,200 gal. water
- 1,200 gal. X 32" rainfall per year= 38,400 gal/yr

# Maintenance

- Keep Gutter and Downspout Clean
- Clean Filters
- Check for Leaks
- Check Pump
- Protect Pump from Weather

# HB 645
# 2003 Texas Legislature

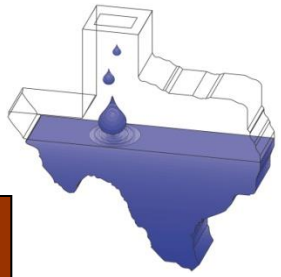
- Prevents homeowner associations from implementing new covenants banning outdoor water-conserving measures
  - Composting
  - Water efficient landscapes
  - Drip irrigation
  - Rainwater harvesting installations
- HOA's can require screening or shielding to obscure view of tanks

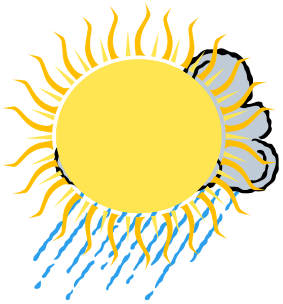
# Incentives

- Salt free water
- Tax Exempt
- Reduce water bill
- Save electric bill
- Reduce demand on water treatment plant
- Reduce Stormwater Contamination
- Reduce Erosion

# Urban Water Budget – Pavement and Rooftop Scenario

# Urban Water Budget – Rainwater Harvesting Scenario








CLEMSON
PUBLIC SERVICE

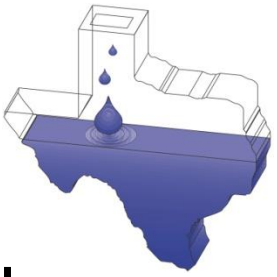
# Label Container

- Not potable water
- Not for drinking, cooking or washing
- The water in your rain barrel will most likely contain fecal coliform bacteria from bird droppings and other potentially harmful microbes.

# Mosquitoes

- Gutters:  You may have standing in your gutter, you could have mosquito larvae in this water so be sure that your filter screen is in place.

# Containers



- Best barrels are polyethylene plastic and some are hydrophobic (inside products do not leach into the wall of the barrel).
- Barrels may contain food grade products, soaps, kitchen sanitizers. Kitchen sanitizers are used to clean food processing equipment in dairies, wineries, beverage, beer, and food processing plants.
- A 55 gallon barrel weighs about 400 pounds.

# In Conclusion

- In the year 2060, (44 years from now) the Texas Population will increase by an additional 21 million people.
- Every household should have a rain barrel(s) to harvest water.

# Resources

- http://rainwaterharvesting.tamu/
- http://texaset.tamu.edu/
- http://aggie-horticulture.tamu.edu/
- http://turf.tamu.edu/