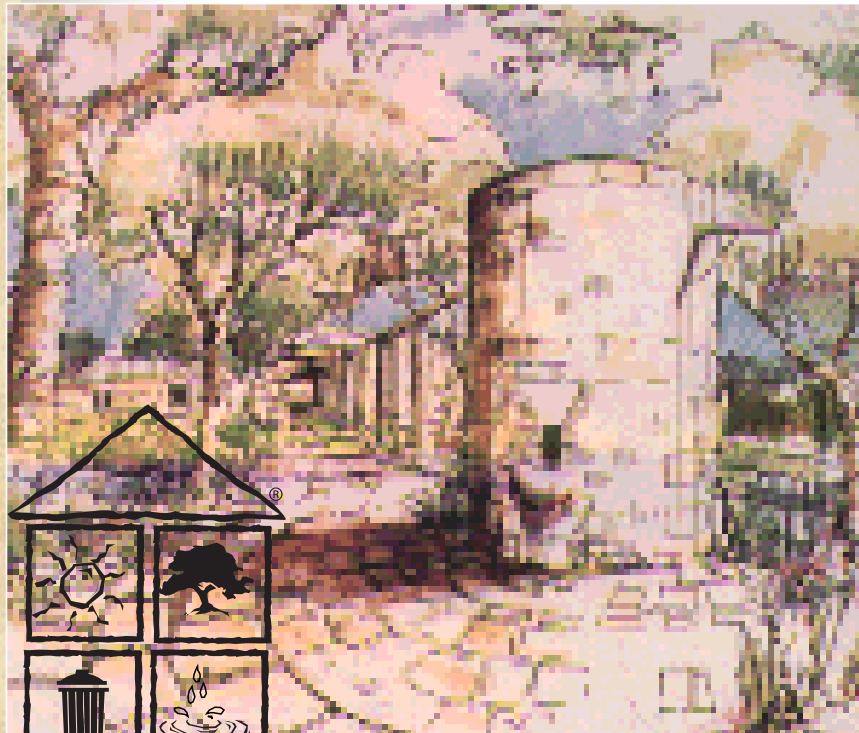


# Rainwater Harvesting for Landscape Irrigation

Dick Peterson

Environmental  
Program  
Coordinator

Austin Energy  
Green Building Program



AUSTIN ENERGY  
GREEN BUILDING  
PROGRAM

[www.austinenergy.com](http://www.austinenergy.com)

# Rainwater Through The Ages

- 🌍 Rainwater harvesting practiced for over 4,000 years in desert of southern Israel
- 🌍 Ancient Roman had cisterns and aqueducts
- 🌍 Early 1900's farms and ranches had cisterns
- 🌍 Current resurgence of rainwater collection Lady Bird Johnson Wildflower Center
  - 🌍 Currently 72,000 gallon capacity
  - 🌍 have plans for another 25,000 gallons
- 🌍 Many Caribbean nations mandate rainwater harvesting





# Why Collect Rainwater?

- 🌍 Rainwater pH is almost neutral
- 🌍 Plants love it
- 🌍 Rainwater does not have dissolved minerals from the soil
- 🌍 Or chemicals from water treatment plants
- 🌍 Harvesting reduces erosion
- 🌍 Reduces water bill – you do not use as much expensive potable water on your landscape

# Components

## 🌐 First Flush “Poor Man’s Roof Washer”



🌐 PVC pipe with fittings running to the ground with a screw on cap at the bottom for clean out

🌐 First 8-10 gallons collects debris from roof and gutters -- diverted by first flush before tank inlet

# Components

## 🌐 First Flush “Poor Man’s Roof Washer”



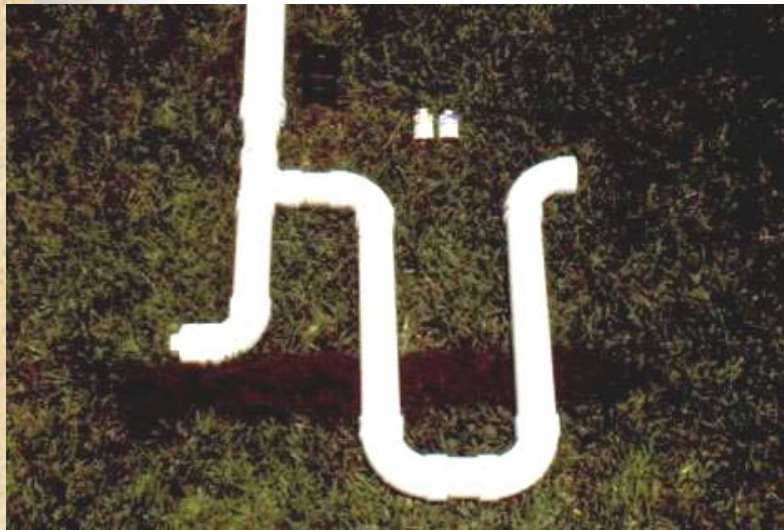
🌐 PVC pipe with fittings running to the ground with a screw on cap at the bottom for clean out

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# Components

## 🌍 First Flush “Poor Man’s Roof Washer”



















🌍 PVC pipe with fittings running to the ground with a screw on cap at the bottom for clean out

🌍 First 8-10 gallons collects debris from roof and gutters -- diverted by first flush before tank inlet

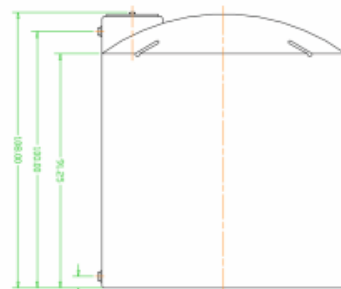
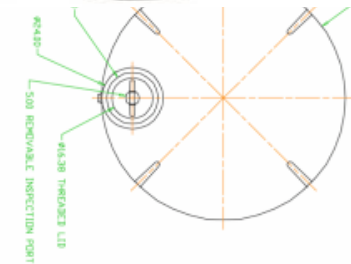
# Components



## PVC Drain-Waste-Vent Fittings

<b>ADAPTER</b> FITTING CLEANOUT SP x FPT (W/PLUG) 	<b>TEE</b> TEST W/PLUG H x H x FPT 	<b>CLOSET BEND</b> ALL HUB (1/4 BEND) 
<b>90° ELBOW</b> ALL HUB (1/4 BEND) 	<b>TEE</b> SANITARY STREET SP x H x H 	<b>T-Y</b> LONG TURN ALL HUB 
<b>90° ELBOW</b> SIDE INLET ALL HUB (1/4 BEND) 	<b>90° ELBOW</b> LOW REEL INLET ALL HUB (1/4 BEND) 	<b>PIPE INCREASER</b> ALL HUB 
<b>22 1/2° ELBOW</b> ALL HUB (1/16 BEND) 	<b>ELBOW</b> DOUBLE ALL HUB 	<b>TEE</b> CLEANOUT 2-WAY ALL HUB 
<b>45° ELBOW</b> ALL HUB (1/8 BEND) 	<b>60° ELBOW</b> ALL HUB (1/8 BEND) 	<b>PVC BALL VALVE</b> THREADED 
<b>PVC TRUE UNION</b> THREADED OR SOLVENT 		

# Tanks are available in many sizes and configurations

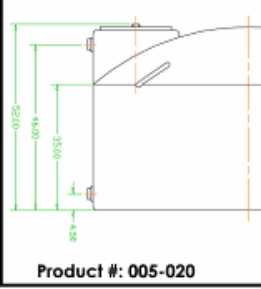
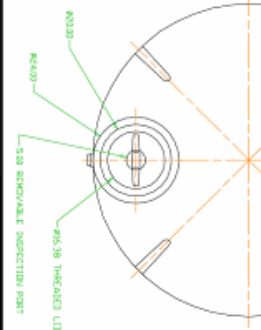


Product #: 005-040

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**AMERICAN TANK**  
COMPANY, INC.  
(800) 455-9100 www.american-tank.com

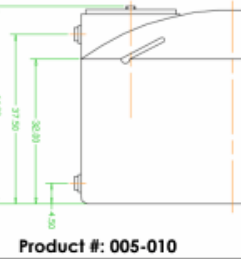
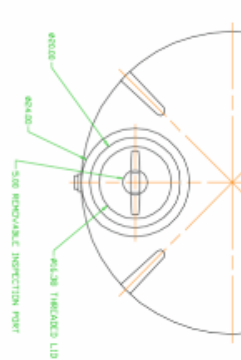
3,000 Gallon Freshwater Poly Tank 95Dx108H  
Customer: \_\_\_\_\_ Order #: \_\_\_\_\_  
Approval: \_\_\_\_\_ Date: \_\_\_\_\_



Product #: 005-020

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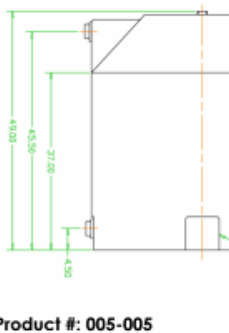
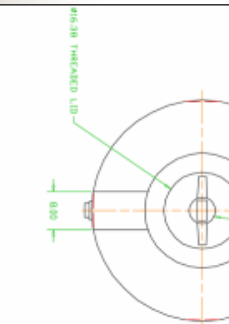
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Approval: \_\_\_\_\_ Date: \_\_\_\_\_



Product #: 005-010

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550 Gallon Freshwater Poly Tank 67Dx44H  
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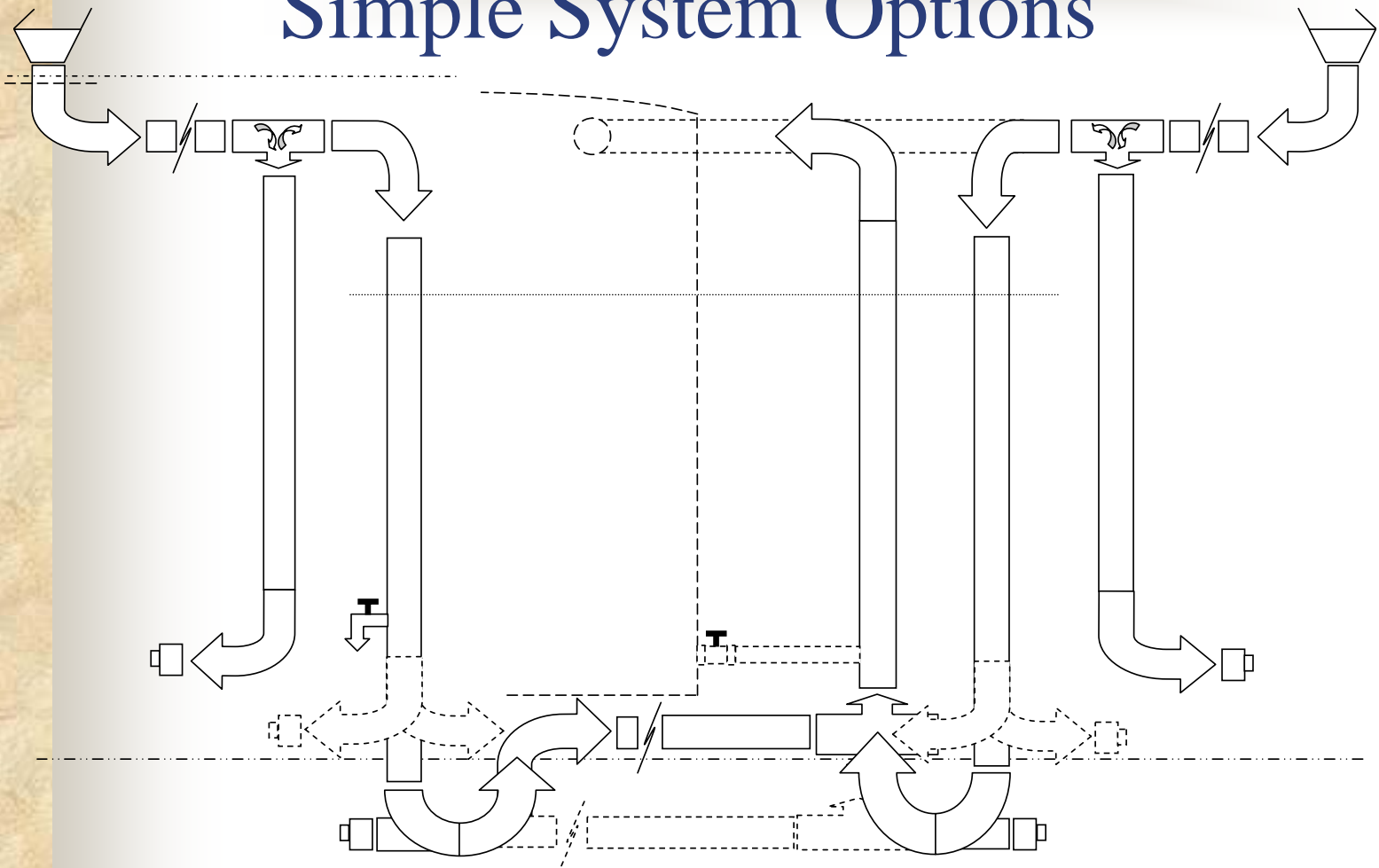
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**AMERICAN TANK**  
COMPANY, INC.  
(800) 455-9100 www.american-tank.com

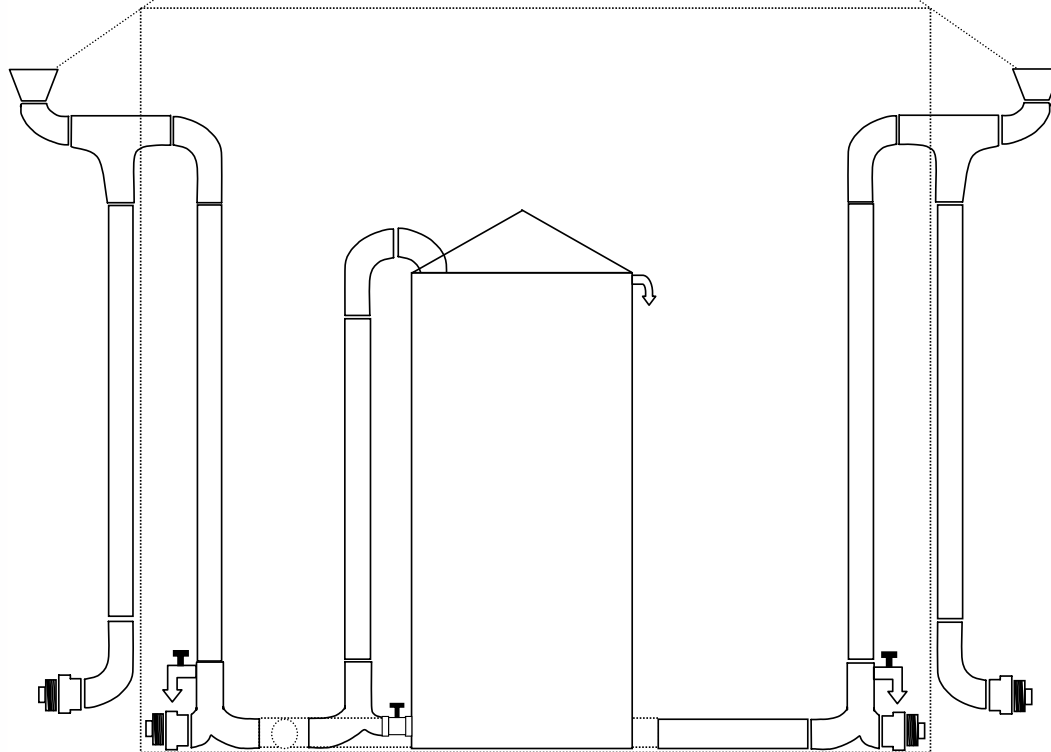
305 Gallon Freshwater Poly Tank 46Dx49H  
Customer: \_\_\_\_\_ Order #: \_\_\_\_\_  
Approval: \_\_\_\_\_ Date: \_\_\_\_\_



# Simple System Options



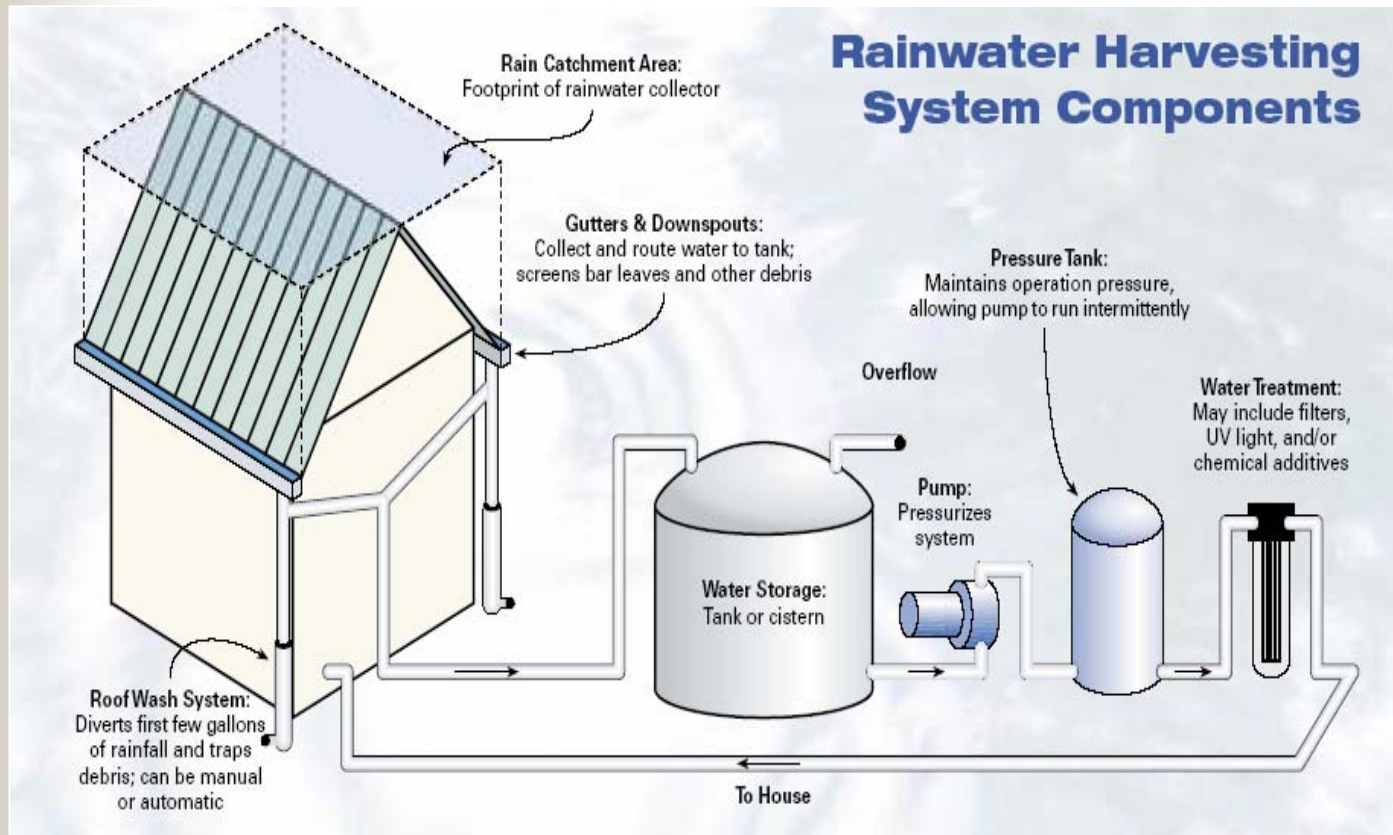
# Simple System Diagram



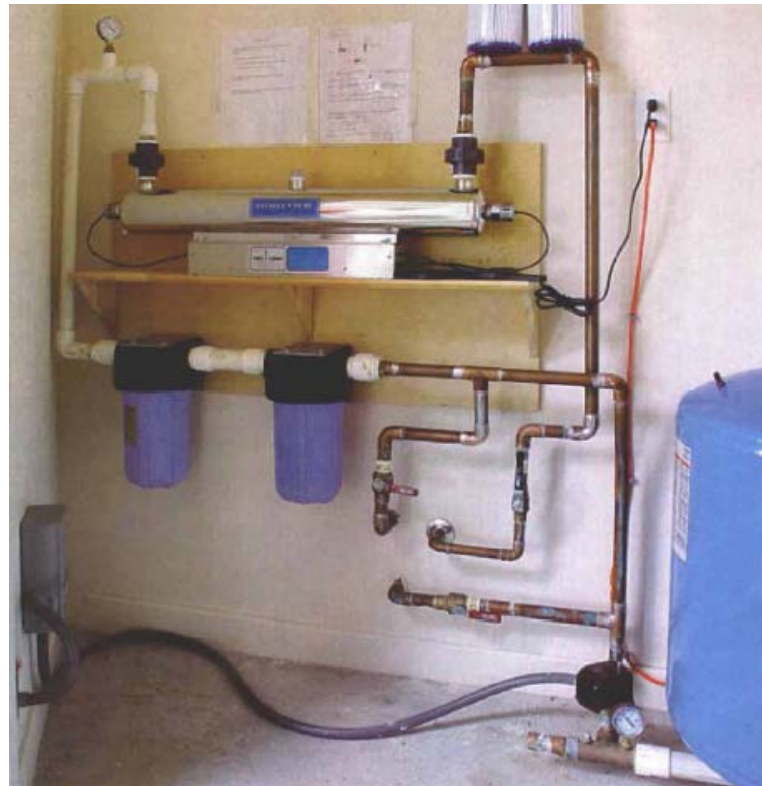
# How about a pond tank?



# Drinking Water Systems



# Drinking water systems require more equipment and maintenance



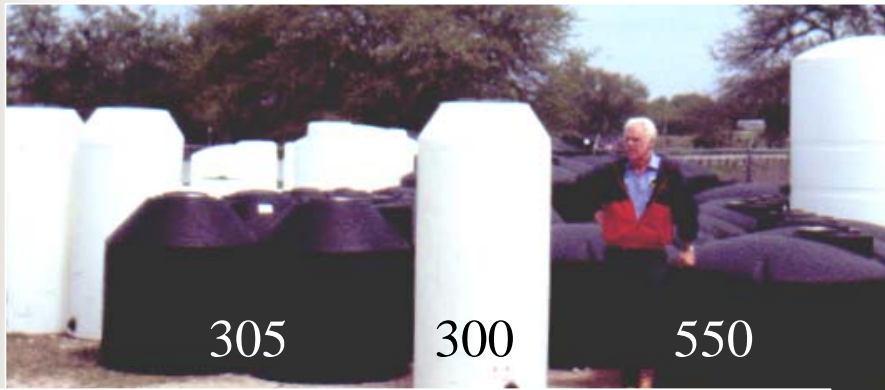
From "Rainwater-Collection Systems"  
by Peter Pfeiffer  
Fine Homebuilding Magazine



Drinking water systems require more equipment and maintenance



# Good source of tanks are “feed and ranch” stores



To reduce algae, tanks should be black, green, covered, or painted



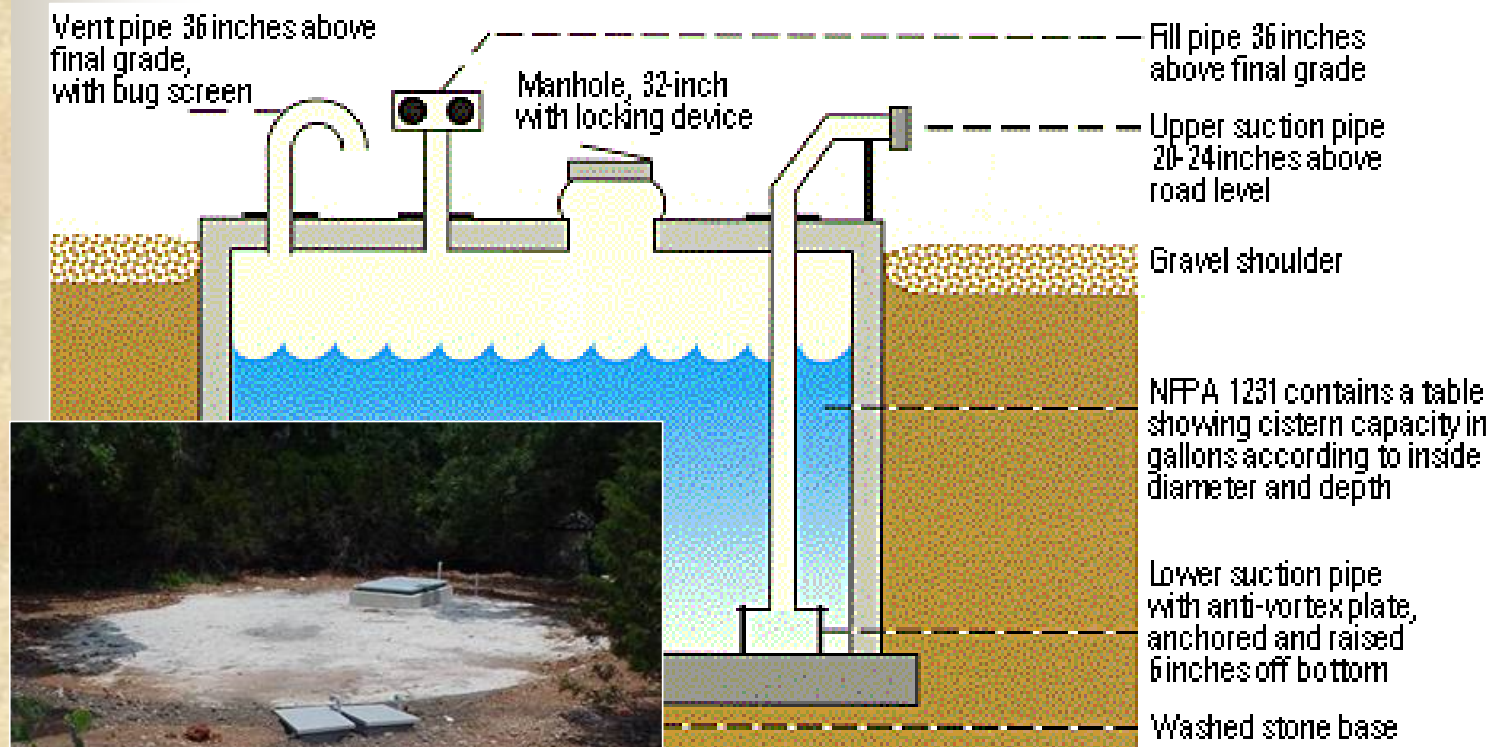


A 10' x 10' garden shed can  
collect 60 gallons in just a 1" rain



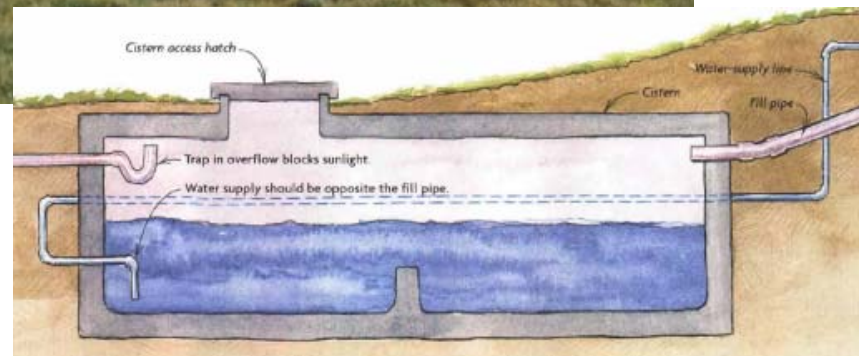
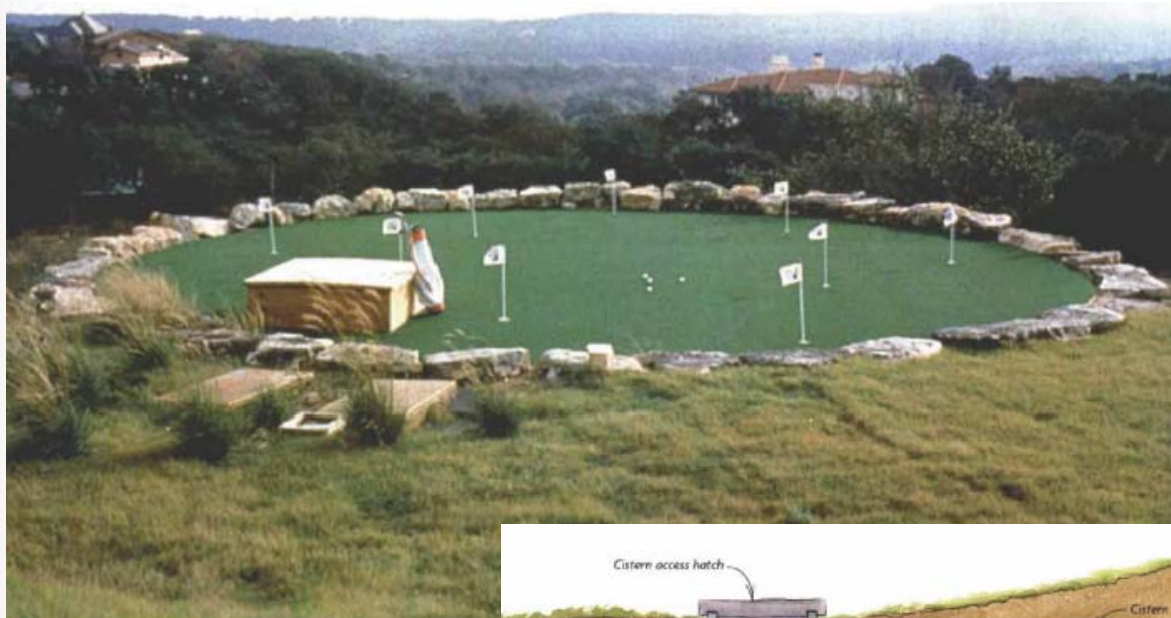
750 gallon fiberglass tank

# Typical Underground Cistern





# 37,500 gallon Ferro-cement tank



From "Rainwater-Collection Systems"  
by Peter Pfeiffer  
Fine Homebuilding Magazine

# Wooden Tanks



# How much will rainwater harvesting cost?

🌐 It really does vary...

- 🌐 Do you already have gutters?
- 🌐 If not, what type will you install?
- 🌐 Type and size of tank
- 🌐 Will you use a pump?
- 🌐 Pad construction









# Components

## Roof Type

 Any roof will do

-  Metal is the ideal roof - smooth and non-absorbent
-  Composite, wood shingles, asbestos...all absorb water and will break down over time

## Gutters

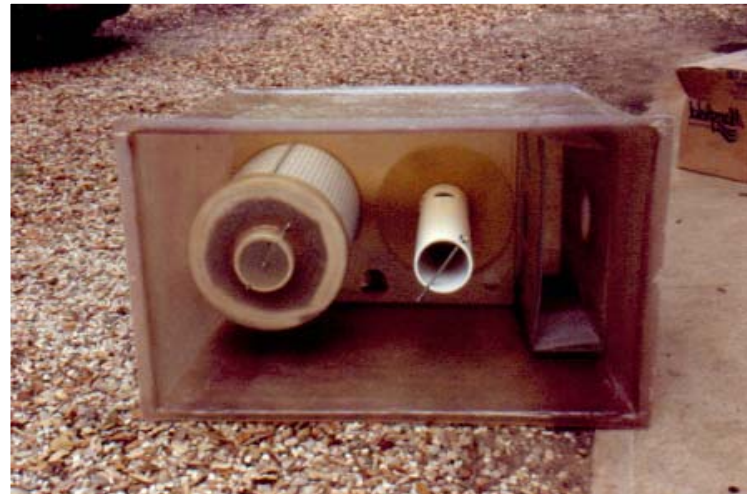
 30 cents per foot for plastic up to \$15 per foot for copper

## Screens

 Screens are not necessary unless your house has a lot of tree cover

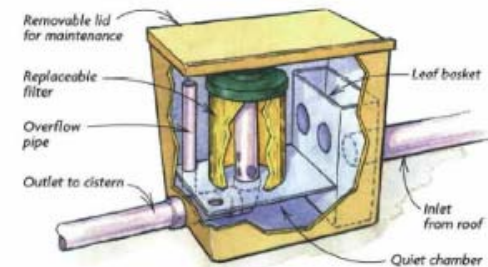
# Components

## Roof Washer



### **Roof washers clean the water, not the roof**

The first water to fall on the roof cleans away dirt and debris accumulated since the last rain. Commercially available roof washers such as the one shown here funnel the water first through a leaf basket that collects the heaviest debris. The first 35 gal. of water, which is the dirtiest, fills the quiet chamber, where it drains away slowly. Cleaner water then passes through a replaceable filter element.



From "Rainwater-Collection Systems"

by Peter Pfeiffer

Fine Homebuilding Magazine





# Components

## Roof Washer

 \$300-600

 container with 30 micron filter

 water must pass through filter  
before filling tank

 If not cleaned regularly

 breeding ground for bacteria

 will keep water from entering tank

 not necessary for non-potable  
systems

# Components

## Barrels

-  Purchased or recycled barrel
-  Should be painted to keep out sunlight and prevent algae growth



# Components

- 🌐 **Polypropylene Tanks**
  - 🌐 \$.35 to \$1.00 per gallon
  - 🌐 Most common
  - 🌐 Easy to install
  - 🌐 Should be black, green or painted



# Components

## 🌐 Concrete or Ferro-cement tanks

🌐 \$.35 to \$1.00 per gallon

🌐 Durable

🌐 Can be buried





# Components

## 🌐 Metal Tanks

🌐 40-60 cents per gallon

🌐 Short life span – rust, except with special liners





# Components

## 🌐 Wooden Tanks

- 🌐 \$2.00+ per gallon
- 🌐 Ideal for remote locations, pack in the pieces
- 🌐 Can be disassembled and moved
- 🌐 Available up to 2,000,000 gallons!



# Components

- 🌐 **Stone Tanks**
  - 🌐 Very expensive
  - 🌐 Difficult to maintain





# Components



## Pumps



\$200-600



install pump as close to tank as possible



protect from freezing



in-tank float switch



in general 3/4 quarter horsepower is sufficient



It will allow you to pump water 400 feet



# Maintenance

- ① With a first flush system you will want to clean out the PVC after every rainfall
- ① If you have screens, clean them after a rain when there has not been any rainfall for a period of time
- ① Most people who have installed their systems over the past 5 years, have not had to clean the tank of debris



# Bt-Biological Mosquito Control



Whisky is for drinkin'...



Water is for fightin' over!

Mark Twain

Water is a precious resource...

Use it wisely...

**Harvest rainwater!**

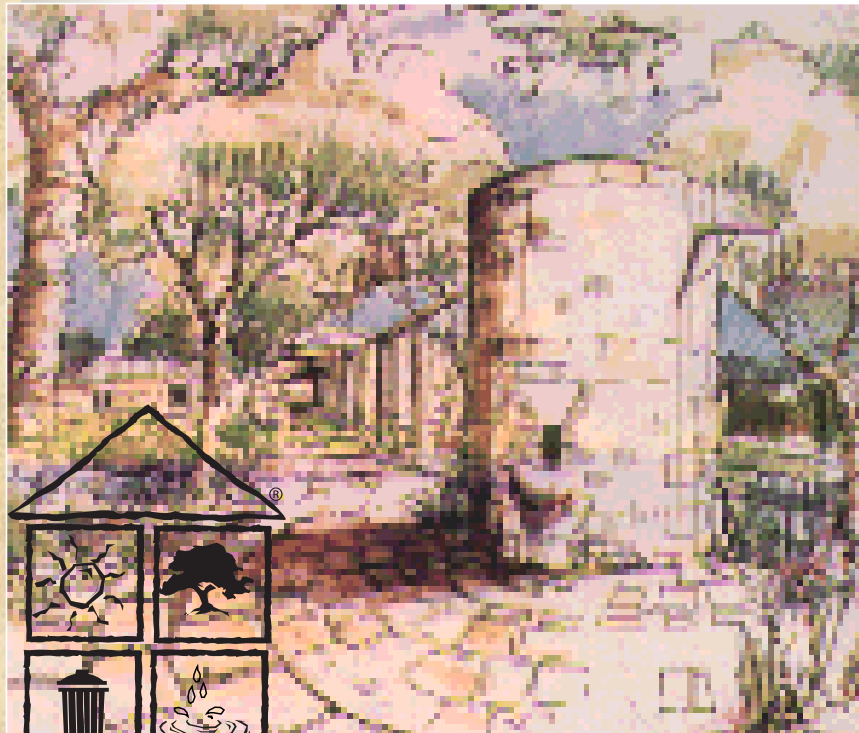
Austin History Center, St. Edward's cadet straddling Lake Austin

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