Rainwater Harvesting for Grow Green Professionals

Dick Peterson
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Total Hydrology Planning

- Total Moisture Budget
- Plant Considerations
- Irrigation
- soil building
- Rain Water Catchment
- Wind & Solar Exposure
- Grading & Earthworks
- Observation/Client Understanding
- Municipality/HOA Restrictions
Rainwater Harvesting Methods

Passive Catchment
Use finish grading and earthworks to manipulate water for the following reasons:

Absorb catchment overflow
Slow, Spread & Sink stormwater into soil
Reduce offsite runoff & erosion
Reduce grey infrastructure, LID
Make available to plants & habitat
Self irrigating landscape

* The cheapest way to get water back into the landscape. Not a significant ground water recharge strategy.

limited time latitude,
- more planning required
Rainwater Harvesting Methods

Active Catchment
- Capture rain off roof or other surface.
- Basic organic / particulate filtering
- Store in tanks above or underground.
- Filter options
  - (Pressurize?)
  - Delivery system

Maximum time latitude
- Less planning
Storm water Run-off
Just how much?

- 1” of rain on 1 acre generates 27,000 gal. of water
- 1” of rain on a 20 x 50 mile heavily urbanized city will generate 17.4 billion gal. of water!
- 1” of rain on a 1,000 sq. ft. roof can STORE 600 gal. of water!

This…

<table>
<thead>
<tr>
<th>City maximum impermeability (Contamination)</th>
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<tr>
<td>99% impermeability</td>
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or This?

1% infiltration

[Image of storm water contamination]

[Image of water storage tank]
Green Solutions for Stormwater Runoff
Green Solutions for Stormwater Runoff

Make runoff water take the LONG way to the river!
From Brad Lancaster’s books, www.harvestingrainwater.com
Green Solutions for Stormwater Runoff
The Perfect Marriage of Two Effective Strategies

Rain Cisterns + Rain Gardens
The Perfect Marriage 
of Two Effective Strategies

Rain Cisterns + Rain Gardens
Green Solutions for Stormwater Runoff

Impervious surfaces include roof tops, driveways, sidewalks and even saturated turf areas.
Green Solutions for Stormwater Runoff

Impervious surfaces include rooftops, driveways, sidewalks and even saturated turf areas.
Tucson as you expect to see....
Tucson, 10 years later!
The Perfect Marriage of Two Effective Strategies

Rain Barrels + Ponds
A 10’ x 10’ garden shed can collect 60 gallons in just a 1” rain

750 gallon fiberglass tank
Typical System

1. Rain
2. Mesh filter
3. Gutter
4. Leaf filter
5. Diverter
6. Filter
7. Storage tank
8. Output
9. Monitor
10. Pump
Tanks are available in many sizes and configurations.
Components

House+Earth
Components
Components
Components
Components
Components

DRY System

House+Earth
Components

Vortex Filters complements Joe Wheeler
Components

Potable water system with filtration and UV light on a 365 day count-down timer
New Underground Systems

Rainwater harvesting with Aquascape’s RainXchange® Rainwater Harvest System

Biological Filter
- Benefits: bacteria and enzymes reduce organic waste and pollutants to less toxic substances that can be absorbed by plants, thereby creating a perfect cycle of nutrient reuse.

Irrigation System
- Natural water is loaded with microorganisms and compounds that will make your plants flourish.
- A healthy garden consumes more greenhouse gases and property irrigated soils allow for greater water infiltration and better overall soil profiles.

Aquatic Plants
- Providing food and shelter for a great number of birds, insects, and beneficial bacteria, and the conduit for maintaining our biodiversity.

Connecting Pipe
- Carries the water via gravity to the main storage chamber (sold separately).

Rain Filter
- Captures and removes pollutants trapped inside the system during a rain event.
- Coarse filter screen removes leaves, dirt, and seeds.
- Smaller suspended particles are captured in a fine mesh which can easily be removed for cleaning.

Modular Storage Basin
- Modular design can be configured to fit a wide variety of applications and settings.
- The storage basin consists of modular plastic units that are assembled on site.
- ETFE (ethylene tetrafluoroethylene) creates a watertight basin.

Flexile PVC
- Easy installation with minimal head pressure, which ensures overall efficiency.

Snorkel™ Vault & Centipede™ Module
- Optimized water utilization within the system and a convenient access point for yearly maintenance and cleaning.

High Efficiency Pumps
- Submersible in-circuit pumps function 24 hours a day and can be utilized for the delivery of water to your landscape.

Overflow Infiltration
- Excess rainwater is sent to a storage area that facilitates the infiltration of water into deeper soils and sediments.
Design Options

Joe Wheeler
Design Options
Design Options

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Design Options
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Dry System
Design Options
Casis Elementary School
Garden Classroom
Design Options
Design Options
Design Options
First Flush System is Custom
Design Options

Ferrocement, a mixture of Portland cement and sand applied over layers of woven or expanded steel mesh and closely spaced small-diameter steel rods rebar.
Design Options
Design Options
Wet System w/FFF
Wet System w/FFF
Design Options
Design Options
Rotational Molding in Austin!
10,000 Gallon Available Soon
Wet System w/FFF
Non-potable System in CoA

Purple Pipe Now Required for Rainwater Systems
Rainwater Rebate

Rebates of $0.50 per gallon (non-pressurized) and $1.00 per gallon (pressurized) are available to customers of Austin Water or a qualifying water provider for installing rainwater harvesting systems. The maximum lifetime rebate amount is $5,000, not to exceed 50 percent of the project cost. Participation is limited to once every 12 months until the maximum rebate amount is reached. Systems of 500 gallons or more require approval prior to purchase and installation. For tax purposes, commercial and multi-family properties must submit a completed IRS Form W-9.
Additional Program Requirements

For systems with 500 gallons or more of capacity:

- Include site and system drawings with rebate application. View examples.
- Submit a completed rebate calculation worksheet with final receipts. Download the rebate calculation worksheet.
Rainwater Rebate

5811 Sinclair Ave.
Proposed System For
LAS CASAS VECINOS MODEL
12-8-09
Paul Martin
P. Martin Hoffer

6" Gutter
downspout
4" D.S.
4" Pvc
Union

Overflow (Alt)

Union

6" Dr.

G-RaDe

6" Dr.

G-RaDe

"T" with
Reducer Bush
and H.B. for Coupler.
Use drain down to self remove static water.
For pressurized rainwater harvesting systems:

- Install a Reduced Pressure Principle Backflow Preventer (RPZ) immediately downstream of City of Austin water meters.
- Install an RPZ supplying the make-up water for the irrigation system, or permanently disconnect the irrigation system from the potable water system. Alternatively, an approved air gap may be installed immediately upstream of the connection to the irrigation system.
- An operational test of each RPZ must be conducted by a state licensed Backflow Prevention Assembly Tester registered with the City of Austin.
- Install an expansion tank or similar device to allow for the dissipation of excessive pressure.
- Retain the services of a qualified person to perform a Customer Service Inspection.
- Visit the Special Services Division website or contact them at 972-1060 for additional requirements and questions.
Rainwater Rebate

No Purple Pipe Here!

Why?
Bt-Biological Mosquito Control
Rainwater Harvesting for Grow Green Professionals

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