

Public Works Rain Harvest System "Keep it simple!"

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Presentation Objective

- Demonstrate how a rain harvest system can be kept simple,
 from design through installation
- Discuss the thought process and decision making behind the components of our rain harvest system
- Keeping costs down by using "off the shelf" materials
- Using public works staff for assembly, which saves money and encourages buy-in from the department
- Provide real costs so you can see how inexpensive a system can be in hopes that you'll do one as well!!



The idea

- Originated from the City of Montgomery's Environmental Advisory Commission
- Made up of residents who look for ways to increase recycling, save on utility costs, reduce energy consumption, and implement green practices to improve the environment





The funding

- Montgomery is a member of the Hamilton County Stormwater District
- Applied for a grant with them, and were successful!
- 80/20 Share











The site

- Collecting from the back half of the public works building, which is 5700 sq-ft
- Eliminate 3 gutter downspouts and add 2 centrally located







Rain harvesting potential

1¹/₂" rain produces over 5300 gallons of water!



30" to 35" of rain per year.... over 100,000 gallons!!!

Montgomery.

Tank selection

- Opted for a 5000 gallon tank (capture up to a 1 ½" rain)
- Height: tank has to be short enough to feed your gutters into it (bottom of gutter – 18'-2" tank height - 12'-8")
- Diameter: go with a maximum diameter of 8'-6" due to freight cost, anything larger than that is considered a "wide load" thus cost WAY more for trucking
- Color: go with black or green to help keep sunlight out, thus helps prevent algae from forming
- More difficult to find opaque tanks, thus we purchased ours from Norwesco, shipped from Norwesco, New York

5000 gallon green tank



Cost including freight = \$3330





Concrete pad for the tank

- Went with a 13'x13' reinforced concrete pad, 12" thick
- Used our public works crews to excavate, compact the subgrade, form it up, and perform the concrete finishing







Gutter & Downspout Work

- It's the only work we contracted out for the project
- Replaced 3 downspouts with 2 to be fed into the tank (did roof calcs, 2 was adequate), also resealed gutter seams









Commercial screens

- Installed two 6" commercial screens (zincalume steel)
- Downspout water is directed onto the screens. Leaves, debris, etc. simply run off. Works great...but still need to clean them off from time to time.





Cost = \$160 x 2 ea. = \$320



6" PVC Pipe System

- Purchased 6" PVC pipe, wyes, bends, clean-outs, and fittings
- Purchased two 6" PVC ball valves (by-pass during winter)
- Did all of the assembly ourselves, including cutting holes in
 the tank to feed the pipe (sealed it with silicon)









Overflow

 Installed an overflow for when the tank fills up (connected it to the existing downspout collector pipe)





Pipe System and Ball Valves







Cost = \$1840



Floating in-take with screen

- Installed inside the tank, connected to the 2" outlet drain
- The float "pulls" the hose up to draw water from the middle of the tank, where the water is the cleanest!









And that's the system



Total Cost = \$8,170



Harvested rainwater uses

- Filling up our water truck used to water our downtown flower hanging baskets and pots, landscape beds, and new tree and sod installations
- Most of the time, no pump is needed (gravity does the trick)







Conclusion

- A commercially sized rain harvest system can be designed to be simple yet effective, thus easy and affordable to install!
- The system can capture a substantial amount of rain water, saving on water utility costs WHILE also removing storm
 water runoff from the downstream, which helps reduce flooding and creek erosion.
- The products are out there. You just have to piece them together to fit your particular application.
- Make use of the skills and ideas of your public works staff, and get them involved with the installation, which encourages use of the rain harvest system.







Questions?

