

# Filters, Water & Instrumentation, Inc.

## Rainwater Stormwater Reuse



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Rainwater/Stormwater Reuse Ideas

There are several different options which depend on where the recovered rainwater/stormwater is used.

The uses we currently see are:

- 1) Flushometer water.
- 2) Irrigation Water.
- 3) Water for Gardening and Exterior maintenance which is similar to number 2 above.
- 4) Cooling Tower Water to make up for Blowdown and Evaporative Losses.

System Design Concepts

Flow Designs – Most of the variations in design are based on the logistics of where the water is collected versus where the reclaimed water is used.

One Design Concept of a Rainwater/Stormwater Reuse system is to recirculate the water intermittently throughout the day through the filter and UV components to keep the system from going septic during low consumption periods.

Alternatively the system pump can send water “once through” the filter and UV and up to the use points.

Another approach is to flow from the collection tanks down by gravity to the points of use. This is easily understood for systems where the water is captured up higher in the building with the use points lower – high rise office and apartment buildings are the trends here.

Finally you can have the filtration/UV loop recirculating independently from the pump which sends water to the use points.

You can actually have variations of all the above if you have several different use points and/or several different collection tanks for the system.

The ultimate design and expense in a retrofit system is the space involved for the storage tanks. Storage tanks and the attendant plumbing are fairly straightforward in new construction. “Shoehorning” in storage tanks and piping in an older facility is more difficult especially difficult for flushometer retrofits. Flushometer retrofits are just about impossible because of the separate plumbing supply lines. Cooling Tower water, gardening and irrigation water are easier retrofits because of the reasonable expense of the new plumbing supply lines.

Rainwater/Stormwater Reuse Components



Amiad and UV Rainwater ReUse System

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Typical System Components are as follows:

Collection Tank(s) are whatever is used to collect the water. The tanks can be underground, at grade, inside or outside.

Pumps are used to either continually recirculate the water through one of the Loop Options and/or provide the pressure and flow needed to get the water at the required flow and pressure up to the system use points. The pumps can be flooded suction, centrifugal external, duplex alternating, in-tank turbine type or whatever may be required. Expansion tanks can be used to more easily run water up to the use points in the system

The filter shown is an automatic backwashing 25 Micron screen filter which cleans itself by backwashing to drain. It runs and cleans itself automatically and maintenance free which we consider essential to the operation of a rainwater/stormwater reuse system. Low maintenance is essential in this reuse application in order for the savings on the project to be realized.

The Ultraviolet unit is a non-chemical method to control bacteria. The UV Unit is sized kill bacteria at the system design flow rate.

A Chlorine Addition Option is a tank and chemical feed pump combination which will feed at a measured dosage into the system based on an automatic feedback controller. This option is not nearly as “green” as the added chemical – Clorox – is not a green solution. Clorox can be considered as a supplement to the UV unit when the bacterial load is too high.

A Dye Addition Option is a chemical feed pump and tank combination which will feed dye to the water to add extra assurance that the water sent to the use points will not be consumed as potable water. This is frequently required by code for flushometer water.

If there is a recirculation loop in the system, the intermittent control is typically run by a PLC based processor which allows for changing parameters based on system operation.

Rainwater/Stormwater Reuse Components – 5/9/08

A system that recirculates 60 to 80 GPM and storing and recirculating 10,000 to 20,000 gallons will costs \$ 50,000 to \$ 60,000. The storage tanks and installation of this system is not included in the pricing above.