Sky HARVESTER™

Photo courtesy of Clock Shadow Building, Milwaukee
Developer: Juli Kaufmann, Fix Development

Turn Key Water Harvesting Solutions

What is a SkyHarvester System?

### A Single-Source Solution for Water Harvesting & Re-use

A water harvesting system gathers water from one or more building locations such as rooftops, parking lots, and air conditioning units. The smart system design includes pre-filtration to clean the water upon collection, a custom storage tank, and an integrated pump station to distribute it for your intended use. Many systems include post-filtration and water treatment for uses requiring a higher degree of water quality. The SkyHarvester Controls tie it all together, and turn you, the user, into a true water manager of your own sustainable water source.

"Single Source Responsibility: to the greatest extent possible, obtain the system components from one source and from a single manufacturer."

Excerpt from The Federal Green Construction Guide for Specifiers, 2010

The Water Harvesting Process

The diagram at right illustrates the key considerations for a successful water harvesting system. Each project should begin with a complete analysis of available water sources to maximize system potential and desired end use. We will now follow the water through the entire harvesting and reuse process to help explain exactly what you can expect from a SkyHarvester system.

CATCHMENT
PRE-FILTRATION
STORAGE
PUMPING
CONTROLS
REPLENISH-MENT WATER
POST-FILTRATION
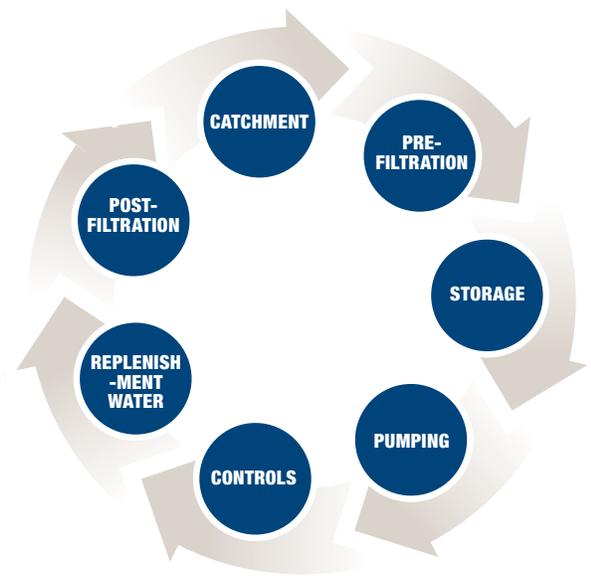
Catchment

The catchment area can be any surface that water falls upon or any device that discards water. Hard surface roofs, green roofs, and parking lots are a few of the most common collection areas. Others include synthetic turf, children's splash pads, cooling towers and air conditioning units.

Depending on what surface we're collecting water from, the level of filtration necessary may vary. This is where Pre-filtration comes into play.

Pre-Filtration

Selecting the proper pre-filtration method is an important step in the water harvesting process. A pre-filter is used to remove dirt, debris, and organic matter from the harvested water in order to keep the storage tank clean, resulting in better water quality and less tank maintenance. Some filters have a form of oil-water separation and some offer automatic self-flushing capabilities. The best way to filter the water is at the source. The better the filtration upstream, the less money/effort will be required for filtration downstream.

Storage

Selecting the proper storage vessel is one of the most important decisions that must be made as it directly determines the overall effectiveness of your water harvesting system. An improperly sized tank can mean the difference between running on 5% vs. 95% harvested water. Tank placement on the property is a key factor and must be chosen to best optimize commercial land values. When selecting a tank, considerations include climate, aesthetic appearance, applications and overall budget. Final tank size is determined with a formula that accounts for average rainfall, collection area, other available water sources and water consumption requirements.

Pumping

The Pump Station is the heart of the water harvesting system. Pumps can be submersible (located in the tank or wet well), or self-enclosed horizontal centrifugal such as the WaterMax station shown here. Pump stations can be VFD driven or constant speed. As a division of Watertronics, we have the unique advantage of pump station expertise and 30 years of pumping history, having built over 6,000 pump stations worldwide. Each unit is dynamic factory tested, ensuring your pump station will arrive ready to perform exactly as promised.

Controls

The Controls are what turn the user into a Water Manager. Our Advanced Control technology tells the pumps when to start & stop and controls all ancillary components such as tank level sensor, automatic filtration, injection equipment, etc. SkyHarvester systems operate independently without human intervention and are self-protecting systems.

Our Advanced Control technology provides intuitive operation and the following information:

- Tank level in inches, gallons & percent full
- Pump run-time hours
- 14 different alarms
- Alarm log file with time/date-stamp
- Filtration status & set-points
- Replenishment water status & set-points
- Lifetime total and user-resettable counters for:
  - Total harvested water used
  - Total replenishment water used, up to 3 sources standard
  - Total power consumption data (when option is selected)
- Real-time flow and pressure display of harvested water

- Real-time flow display and On/Off status of replenishment water sources
- Real-time power consumption data (option)
- Ability to adjust all system parameters / set-points
  - Pressure Regulation set-points: Single set-point mode or flow-based mode
  - Water Level set-points: Pump alarm level, pump reset level, alternate source on, alternate source off
  - Post-Filtration set-points: Pressure differential based on flow or single set-point, total gallons pumped through filter, timed interval, flush duration, flush dwell time (multiple filters)
- Ability to communicate with building management system via Serial MODBUS or BAKNET

Replenishment Water

Most of our customers include a replenishment water source in their systems in order to protect against water shortages. It is important to carefully consider the design of the replenishment water system, as errors here could lead to major liabilities for the customer - particularly in the case of toilet-flushing applications. Having a reliable replenishment water source is important for protecting the health of various valuable investments, such as expensive landscape plantings and greenery.

If it is determined that a backup water supply is necessary to provide an uninterruptable water supply, there are two options available: direct plumbing to the water distribution system or routing to the storage tank for filling as necessary.
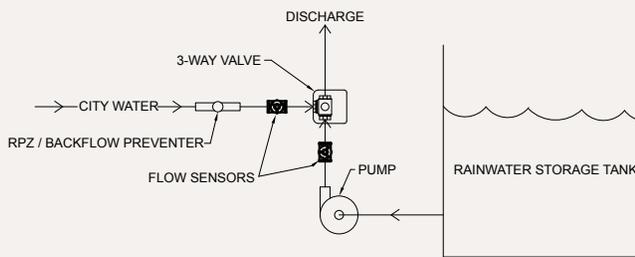
Direct to water distribution
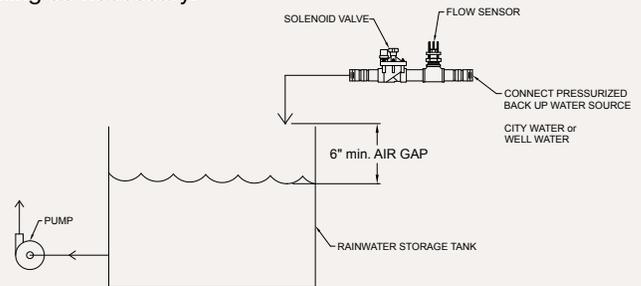
Routed to storage tank

Post-Filtration & Water Treatment

We custom design the post-filtration and water treatment to meet each project's final water use requirements. If used inside the building, Disinfection is often necessary. Standard drip irrigation typically requires filtration to the 100 micron level through Screening. When discharge filtration is selected, discharge filters come standard on our systems and are fully automated by the system Controls.

For particulate screening (TSS), we utilize an automatic suction scanner filter which includes an internal cleaning mechanism that reverses flow across the screen to send unwanted matter out the flush-port. Contrast this with basket, cartridge, Wye strainers, and bag style filters – all which require manual disassembly for cleaning. Even Wye strainers with blow off ports are not fully automatic filters.

Injection of dye or chlorine directly into the post-filtered water can provide treatment for such uses as toilet flushing and vehicle washdown. SkyHarvester systems utilize a real-time injection method which injects the desired amount proportional to the flow rate. This means you have a precise, consistent concentration of chlorine or dye (color) from zero to maximum flow.

Other water treatment methods available include UV, disinfection, chlorination, media filtration, ozone, ultra-filtration, reverse osmosis and deionization.

The SkyHarvester Process

Our team of engineers will work with you to develop a customized system, supported by detailed drawings and complete design documentation. As a result, you'll have peace of mind that the system you've chosen will provide dependable, cost-effective service for years to come.

Watervision 6 for SkyHarvester
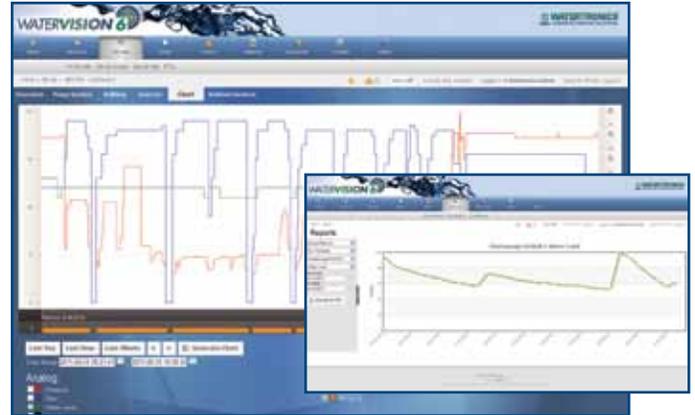
Watervision 6 is a remote monitoring system accessible from any web-enabled device or computer, with no software required. Remote monitoring technology allows you to easily access your water harvesting system data from anywhere, anytime.

Features and Benefits of Watervision 6 include:

- Alerts for alarm conditions, water levels, pump status, etc. via email or text
- Graphing of historical data to analyze system trending
- Report generation for ROI justification of water and energy savings
- Manage data from multiple properties/systems in one easy-to-use website
- Compile cumulative data over time from multiple sources and properties
- Works with all types of water harvesting systems including rainwater, stormwater, cooling tower blow down, and AC condensate
- Reduces costs by minimizing down-time & optimizing operational efficiency
- Turns the end user into a true water manager

Accessible Anytime, Anywhere

WATERVISION 6

A 20,000 gallon composite tank buried beneath the parking lot at UNUM Insurance stores rainwater without compromising real estate.

Some of our Customers…

Coca-Cola Distribution Center,
   Lexington KY
Walmart, multiple locations
Radio Flyer, Chicago
TD Ameritrade Corporate Headquarters,
   Omaha NE
Tactical Unmanned Aerial Support Facility,
   US Military
UNUM Insurance, TN
Carmax, Potomac Mills, VA
Kansas City Performing Arts Center
   parking garage
Project Rainbow at the Bemis Center,
   Omaha
Georgia World Congress Center

Old Dominion University, VA
Penn State Millenium Building
Penn State Henderson Building
Haas Park, Chicago
Cedar Rapids Library, IA
Wishard Hospital, Indianapolis
Dale City Fire Department, VA
Salvation Army Kroc Center, Memphis TN
Piedmont Natural Gas, TN
US Embassy, Tijuana
Utah Natural History Museum
Klein School Park Elementary, TX
Lovett Middle School, GA
John Jay High School, NY
Gonzaga Ball Field, NY

Texas State University North Dormitory
University of Wisconsin, Milwaukee
   Residence Hall
Milwaukee Clock Shadow Building
Northwestern University Silverman Hall
Staten Island Court House
Nashville Play Park, TN
Ocean Springs Splash Pad, MS
Lancaster General Hospital, PA
Memphis Airport, TN
Cottage Grove City Hall, MN
City of Oakville Transit, Ontario
W.L. Gore Manufacturing Facility, AZ

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