



FROM ROOF TO RESIDENCE

Apartment residents receive harvested rainwater for non-potable use

By Mike Warren



The 14,000-sq-ft rooftop houses the prefilters, which keep debris from the roof out of the water storage tank.

When Zien Service Inc. of Milwaukee was asked to incorporate rainwater harvesting into Kendal Lofts, a new apartment building in downtown Waukesha, Wis., Mick Heberling recalled local water technology company Watertronics had built similar systems in the area using its SkyHarvester product line. The challenge was to collect water from a four-story

building roof and use it to flush all the toilets inside and provide water to each unit's washing machine.

System Setup

There are three main components to a rainwater harvesting system: a tank pre-filter; a storage tank; and a pump, control and filtration system.

The prefilter keeps debris that may

collect on the roof out of the storage tank. The best way to filter the water is at the source. With better filtration earlier in the system, less time and money are spent further downstream. Water quality is greatly affected when debris enters the storage tank and decomposes. This makes filtering water before it gets to the tank critical.

The rooftop at Kendal Lofts measures 14,000 sq ft. Two 350- μ tank prefilters



The submersible pump provides the complete flow and pressure required to operate all non-potable fixtures in the building.

were selected based on the roof area and plumbed in parallel to the storage tank. The 30,000-gal storage tank is located below the parking deck, meaning the filters require access from the parking and driving surface. A steel manhole cover

protects the filter from traffic loads. The filters are capable of filtering 200 gal per minute (gpm) of water at 90% efficiency.

The heart of the rainwater harvesting system is the pump station. It provides the owner a window into the

operation and outputs data about the building's non-potable water supply. At Kendal Lofts, a submersible pump was installed in the storage tank below the parking structure. This single pump provides the complete flow and pressure required to operate all the non-potable fixtures in the building (toilets and laundry).

Personal Service

The piping system is pressurized from this pump all the way to each toilet and washing machine. When a tenant uses a fixture, it causes a pressure drop in the piping system, and the pump station then is started. It regulates a constant pressure at variable flow rate utilizing a variable-frequency drive.

The pump station provides 56 gpm and 60 psi and is controlled by a single control panel that operates on 208 VDC, three-phase power. The station contains a

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programmable logic controller and 7.5-in. color touch screen operator interface.

After exiting the tank, the water flows through a 5- μ automatic filter (5 μ is about the size of a red blood cell). This level of filtration is used to prepare the water before it enters the ultraviolet (UV) light unit. Because the water is being used inside a building, UV is used to disinfect the water by rendering organisms like viruses and bacteria inactive.

If the rainwater tank were empty or a problem with the pump station were to arise, a motorized, three-way valve located on the pump station discharge provides a direct connection to the city water supply so as not to interrupt water service to the tenants.

Smart & Flexible

In order to provide flexibility of water choices in their units, tenants have the

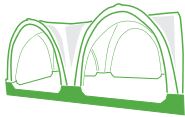
ability to use rainwater or city water to wash clothes and all toilets utilize rainwater when available. When rainwater is not available, city water is used.

A clean, hard-surface rooftop; good prefiltration; and proper post-filtration and treatment ensure Kendal Lofts tenants have clean, consistent, safe and reliable non-potable water. **SWS**

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The pump station's programmable logic controller outputs data about the building's non-potable water supply.



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