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# Michaels Engineering LEED® Brief

## WATER EFFICIENCY: RAINWATER CAPTURE

### SUGGESTIONS...

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### DID YOU KNOW...

...A 10,000 square foot area can capture up to 200,000 gallons of water in a year (based on 32 inches of rainfall per year in the Midwest).

...Rainwater is naturally soft (unlike well water), contains almost no dissolved minerals or salts, is free of chemical treatment, and is a relatively reliable source of water.

### MEET THE AUTHOR

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### WATER EFFICIENCY: RAINWATER CAPTURE

3,700 billion gallons of water! That's the annual water deficit in the United States today. That's more water than the state of Indiana uses in a year! The water we take is used throughout the commercial, industrial, agricultural, residential and recreational sectors. In other words, Americans use 3,700 billion more gallons of water from our aquifers and surface water annually than is returned to them through the natural water cycle. This results in water table and lake levels dropping every year without ever recovering to their previous levels.

In 2000, 262 billion gallons of fresh water a day were withdrawn from surface water, along with 83 billion gallons per day from aquifers. Some of these aquifer levels have dropped significantly in recent years. Parts of our country were so dry this year that watering bans and even rationing had to be implemented for particularly dry periods. We have begun to deal with decreasing supplies of petroleum. Alternative fuels are being developed to help relieve this situation. There is no alternative to water.

Not only does the water deficit itself give cause for concern, but consider the energy used to treat it, deliver it, and treat it again before discharge. An average sized city may have several large pumps operating for most of the year to maintain adequate pressure and flow in the water distribution system.

Water efficiency can be incorporated into our lives in many ways. The obvious step is to reduce the direct usage of water. Another approach is to use an existing water source that generally ends up running through a stormwater drain - our rainwater! As discussed in a previous LEED® Brief, management of runoff is a good thing anyway, to minimize flooding and the potential contamination associated with it.

### RAINWATER CAPTURE

Opportunities for rainwater usage exist for all types of buildings, from residential to commercial and industrial. Average rainfall in the Midwest is approximately 32 inches per year, which equates to approximately 200,000 gallons a year in rainwater capture potential for a 10,000 square foot facility (roof area). In order for this rainwater to be useful, a means of capture and storage is necessary.

Storage can be as simple as a storage tank connected to a downspout, with the water used for landscape irrigation. Or, rainwater capture could be as complicated as a large underground storage system with pumps and piping to provide water for flushing of toilets as well as landscape irrigation. While these systems are best suited to new construction projects, storage systems may also be retrofitted for some existing buildings. Cost for storage is somewhere around $1 per gallon of storage.

Depending on the end-use of the captured rainwater, minor treatment may be necessary, which may include aeration and/or disinfection. Settling is likely required at a minimum to remove the debris that accumulates during capture. Note that rainwater is naturally soft and contains almost no dissolved minerals, making it a relatively clean source of water when care is taken to prevent contamination during collection and storage.