

Enterprises

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Spring/Summer 2008

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Enterprises Challenge

LEED: from the ground up

Civil engineers as a whole have lagged behind Architects in the Leadership in Energy and Environmental Design (LEED) arena. That's somewhat to be expected, since the existing LEED Rating System is for buildings which are obviously architecturally driven, and there is no LEED Rating System for new roads or water treatment plants. Nevertheless, there are numerous ways a LEED Accredited Professional civil engineer can help a project achieve LEED for New Construction certification through credits in the Sustainable Sites, Water Efficiency, and Materials & Resources sections of the LEED for New Construction.

LEED: from the ground up

The Sustainable Sites section of the LEED for New Construction is where the civil engineer will have the most impact, especially for the stormwater design credits. Both the “Stormwater Design, Quantity Control” and the “Stormwater Design, Quality Control” credits would seem to be fairly easy to obtain for development in Northeastern Illinois. Most local jurisdictions have fairly stringent stormwater ordinances in place. However, just following the local ordinances will NOT satisfy either of the stormwater design credit requirements.

To satisfy the “Stormwater Design, Quantity Control” credit on a greenfield site, the detention basin and restrictor need to be designed so that the post-development peak discharge rate and quantity does not exceed the pre-development peak discharge rate and quantity for the one and two-year design storms. The local stormwater ordinances generally regulate just the discharge rate and not the quantity. Placing buildings and pavement on a site will increase the quantity of stormwater runoff. To offset this increase, the site



Wetland Bottom Detention Basin

needs to include measures designed to maximize infiltration. Permeable pavers, bioswales, rain gardens and infiltration basins are examples of Best Management Practices (BMPs) that can help satisfy this credit.

To satisfy the “Stormwater Design, Quality Control” credit, the stormwater management system must capture and treat the stormwater runoff from 90% of the average annual rainfall and the treatment must remove 80% of the total suspended solids (TSS). The local stormwater ordinances do regulate stormwater quality and encourage BMPs. However, they generally do not include specific pollutant removal levels. Luckily, most of the BMPs that will impact the “Stormwater Design, Quantity Control” credit will also impact the “Stormwater Design, Quality Control” credit.

Moving on to the Water Efficiency section, water efficient landscaping can provide two credits. Reducing the potable water usage for landscaping irrigation by 50% will gain one credit and completely eliminating the potable water usage will gain another. One way to reduce or eliminate potable water usage is to harvest rainwater and store it for future irrigation use in a detention basin pond. The volume of water required for irrigation is needed to determine the drawdown of the pond during dry weather periods. A pond provides a focal point for any site and the building owner will need to understand the aesthetic impacts of irrigating with detention basin water. Another advantage to using the detention basin pond for irrigation is that the drawdown creates additional stormwater volume to decrease peak discharge rate and quantity and remove TSS, helping the stormwater design credits as well.

Now let’s look at the Materials & Resources section. Credits can be earned for using recycled and/or regionally sourced materials. Using 10% recycled content in construction is good for one credit and upping that to 20% earns another. Using materials extracted, processed, and manufactured regionally (within 500 miles) can provide two additional credits. The percentage of recycled or regional content is determined by dividing the total recycled or regional



Permeable Pavers

content value by the total material cost. The civil engineer can specify recycled and regional materials within the site improvement plans. Recycled asphalt pavement (RAP), crushed concrete aggregate, recycled HDPE storm sewer pipe and fly ash concrete additives can all be included in the recycled content value. Locally produced pavement, aggregate and utility materials are easy to find.

But that’s not all. There are some design elements which can help earn multiple LEED points. For example, a permeable paver parking lot by itself does not necessarily earn any points, but a properly designed permeable paver system can help the project overall to earn up to 6 points.

To discuss how your next project could incorporate a LEED Accredited Professional civil engineer, contact Bob Walker, P.E., LEED AP, Project Manager at (630) 466-6700 or rwalker@eeiweb.com.

Stretch the Capacity of your Water Works System Through Water Conservation

The Regional Water Supply Planning Group (RWSPG) draft regional water demand report is predicting a nearly 40% increase in population in the combined eleven northeastern Illinois counties by the year 2050 (from approximately 8.7 million to approximately 12.1 million people). This growth will affect all infrastructure and natural resources, but perhaps none more than the regions source of potable water. An increase in the Lake Michigan allocation is highly unlikely due to a Supreme Court ruling, as well as, international treaties. Therefore, increases in water supply will require withdrawals from other sources, including shallow and deep groundwater aquifers and inland surface waters. However, groundwater and inland surface waters, like all source waters, have a finite capacity.

Before a community moves to expand their source of supply, the community should consider whether they can extend the capacity of their current facilities through water conservation. Water conservation is one of the most economical practices to achieve sustainability and protect potable water sources. Conservation benefits include increased capacity and reliability, reduced peak demands and cost savings.

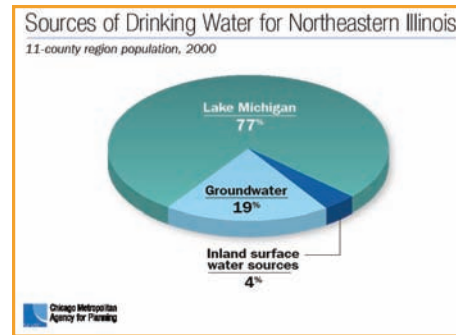


Rain barrels can reduce, or eliminate, potable water use for landscaping irrigation.

The amount of benefit gained from water conservation practices depends on infrastructure age, community policy and public participation. Conservation practices include passing ordinances pertaining to lawn watering and low flow plumbing fixtures, creating tiered water brackets or fee structures, maintaining water meters, providing water use incentives or implementing penalty fees, restricting the development of new lawns, utilizing stormwater best management practices that promote infiltration and encouraging water reuse in planning for

the future. Some, or all, of these water supply management concepts may be right for your community.

Water conservation can reduce overall water use, but it also can significantly stretch out the capacity of a community's water system. In 2005, EEI reviewed water use trends within a number of growing communities in northeastern Illinois. Within this review, EEI was able to

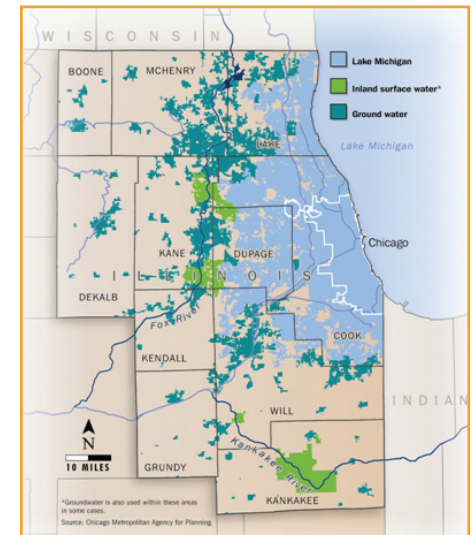


Source: Chicago Metropolitan Agency for Planning

correlate a significant reduction in peak water demands following the passage of a Water Conservation Ordinance. For instance, one community observed a decrease in their maximum to average day water use by nearly 30% following the passage of a water conservation ordinance. Due to the fact that most water system components are sized based on peak water use, a significant reduction in peak water use significantly increases the capacity of water system components.



Unlike the above photograph, smarter lawn watering can reduce water waste.



Water Sources for Public Supply in Northeastern Illinois
Source: Chicago Metropolitan Agency for Planning

To discuss how your community could build water conservation practices into operations and stretch the capacity of your water facilities, please contact Jeff Freeman, P.E., CFM, Vice President at (630) 466-6700 or jfreeman@eeiweb.com.

Enterprises Challenge

Trivia, brainteasers and more...

Correct answers submitted before August 1, 2008 will be entered in a drawing for a \$100 American Express gift card.

Send your answers to Ben Jessup at bjessup@eeiweb.com or fax your answer to 630-466-9380, attention Ben.

Q What Illinois City has an authentic, working Dutch windmill that was featured on a 1980's U.S. stamp?

Fall/Winter 2007/08 Challenge

Q In 1920 which city in the United States was first to erect an automatic stoplight?

A Cleveland, Ohio

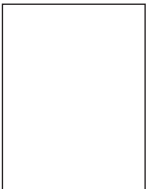
Did You Know?

Twice a year EEI employees and family help out with the Adopt-A-Highway program. Recently EEI conducted the "spring cleaning" of Bliss Road in Sugar Grove. If you would like more information on how you could Adopt-A-Highway visit the Illinois Department of Transportation (IDOT) website at www.dot.state.il.us



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