



Schematic of a rainwater harvest system courtesy of M/E Engineering, Rochester, NY.

THE KEY BENEFIT OF NON-POTABLE WATER PIPING SYSTEMS

CODE-WISE, DEBATE CONTINUES ABOUT THIS PIPING. HOWEVER, THERE IS A CONSENSUS THAT THESE SYSTEMS MUST BE CLEARLY AND EASILY IDENTIFIED FOR HUMAN HEALTH AND SAFETY REASONS.

BY VIC HINES, CPD, LEED-AP

AS SEEN IN **pme**

Non-potable water sources include rainwater, reclaimed/recycled water and greywater. While non-potable water is not appropriate for human consumption, it can be used in a myriad of other applications, such as doing laundry, toilet and urinal flushing, and cooling tower make-up water.

Engineers and architects designing sustainable living and green building projects have a keen interest in utilizing non-potable water. One of the motivators for such projects is the U.S. Green Building Council (USGBC) LEED green building certification program.

There has been an increasing demand to design and build projects that, at a minimum, are LEED certified, and, in many cases, aim for LEED Silver or Gold. Under LEED 2.2 water conservation and

innovative reuse were prime areas rich in LEED points. And under the new LEED 2009 (v3.0), it is weighted even more heavily.

The use of non-potable water can contribute up to 10 LEED points on a project, an astounding 25% of the points needed to achieve a LEED certified building. In fact, the number of LEED points available for water efficiency is even higher if any of these credits are deemed a regional priority by the USGBC regional council or chapter.

It is becoming clear that it is no longer enough to simply install low-flow fixtures. Substantive steps must be taken to conserve the use of potable water by the innovative reuse of gray water, the collection and use of rainwater and, in more and more communities, the use of

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The color purple is used to identify pumps, tanks and pipes carrying reclaimed water for reuse. Photo courtesy of South Florida Water Management District.

municipally supplied reclaimed or recycled water. LEED points are awarded not only for the reduction in potable water use, but also for diversion and reuse of storm and waste water that, in conventional construction, would leave the site.

Water Efficiency is Key

Why all of this attention on water efficiency? Water supply issues are nothing new to some arid western regions, but in recent years, several major cities on the east coast have seen lakes and streams that supply municipal water treatment facilities dissipate to dangerously low levels. It is now an issue across all of the United States. In major cities we were surprised to learn that cooling tower make-up water in some cases represents the majority of water consumed in a building, so making every fixture a "low-flow" unit wouldn't even address the biggest water user in the building.

Water supplies are finite while future demand on that water is infinite. As populations continue to grow we can't keep using precious, treated drinking water to flush toilets and urinals, to irrigate landscapes or for other huge water consumers like cooling tower make-up that can easily use "less than potable" water. It's been said that in future decades, the supply of clean fresh water will be far more important to the people of the earth than the supply of oil could ever be.

A number of companies have pioneered systems for the collection, filtration and treatment of water for these non-potable applications. Until recently the vast major-

ity of this water was used outside of a structure for irrigation. Only now are we beginning to truly appreciate the benefits of non-potable water applications.

Need to Convey Water Inside a Building

As a result, there is increasing demand to convey non-potable water inside the building by installing a separate distribution system for this water to those fixtures and applications that can use it. An engineer can now design a building and have thousands of gallons of non-potable water available for such uses.

From a codes and standards viewpoint, non-potable water piping systems within a building is an area that is still under construction. There are hearings and discussions currently underway, not only in the U.S., but all around the world. One thing everyone agrees on is that non-potable water systems must be clearly and easily identified for human health and safety reasons. There must be no chance that a reasonable person would ever mistake a non-potable water supply line for a potable water line.

In areas where non-potable water systems have been in use for a substantial period of time (Europe, Australia, Canada), the universal color code for "do not drink" is purple. In the U.S., this color scheme has been adopted for PVC pipe used for the distribution of non-potable water *outside* of a building, for irrigation and municipal reclaimed distribution systems.

The engineers that have specified these new systems for non-potable water *inside* of a building told us they have often used copper. They had the contractor paint the copper tube purple and then do some sort of field marking.

After listening and surveying engineering firms in cities big and small, the consensus was that they needed a non-potable, indoor piping system that would:

A) Meet all of the requirements and demands of the commercial domestic potable water systems that they were designing. After all, these new non-potable water systems are going to be distributing water for many of the same

applications and uses that previously used drinking water and would be under the same pressures and demands as the potable systems. From a codes and standards viewpoint, engineers and code officials want a piping system that was already listed as being suitable for potable water in the majority of the nation's plumbing codes because the applications for the two systems mirror one another.

B) Be permanently and clearly marked "Non-Potable Water/Do Not Drink".

C) Meet a 25/50 flame spread and smoke developed rating (per ASTM E 84 test protocol) so that the system could be installed in an unducted return air plenum. This would satisfy commercial construction standards.

D) Have an easy, reliable and proven installation method.

Over the past year, engineers and owners told us about a non-potable water application for which a product is needed, and no dedicated product existed. Because manufacturers are always eager to introduce groundbreaking new products, Charlotte Pipe and Foundry listened with great interest...and then developed the industry's first CPVC non-potable water piping system.

Usually when a new plumbing product, material or method is introduced, the manufacturer meets with architects, engineers and facility owners in an effort to convince them that they should use the new product. But in our case, the reverse happened. **pme**

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