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Effective Water Management and the Ecological Benefits of Using Prefabricated Drainage and Coatings in Managing Water
Michael Schmeida, LEED™ AP- Manager of Sustainable Programs

In the past several decades, humans have seen the need to better manage water resources. No one needs to look further than the seasonal drying up of the Colorado River in Baja California to demonstrate the need for better water management. However, with a booming global population, an on-going energy crisis and global climate change, never has the need to examine how we manage water and what we use to manage that water been more apparent.

Among the easiest means of managing water is via reclamation of either rain water or irrigation water for use in non-potable situations. Since only drinking, bathing, dishwashing and laundering water need be potable, many uses for reclaimed water can be found in either the commercial or residential structure. Many communities either encourage or now require reclamation be minimally considered in construction design and systems like LEED encourage finding means and methods of gathering and reusing water resources.

The traditional means of gathering rain water in the ground is via the traditional pipe and stone method, commonly referred to as a “French drain”. In this method, stone is used as a media for collecting rainwater and it is transported via a pipe to either a reclamation cistern/pond or to the sewer system. A filter fabric is often wrapped around the stone layer to prevent silt build-up and clogging. This can be done along a foundation or in “strip drains” through the property.

In addition, modern science has brought us prefabricated drainage. This is a plastic, “egg-crate” core with a filter fabric glued to it. The material comes in roles or panels and can also be used against a foundation or in strip applications. Much like the pipe in a French drain system, the prefabricated media has fittings, etc. for tie-in to cisterns, sewer lines, etc.

However, in the age of sustainable design, one needs to consider more than form and function. One must also consider the various life cycle issues of the method in question. This is a case where prefabricated is better, as shown below for a backfilled, vertical wall application:

<u>Trait</u>	<u>Traditional Stone/Pipe</u>	<u>Prefabricated Media</u>
Recycled Content	Typically “virgin” stone	70%+ is common
Heavy Equipment Needs	Bulldozer (Burns Diesel)	None
Production Equipment	Dozer, Backhoe (Burn Diesel)	Thermoform (electric)
Material Needed per Yd ² *	1.2 Cubic yards of gravel	¼” thick mat
Social Issues	Worker Injury due to Weight	None perceived
Excess fill dirt to remove?	Significant	Approx. 99% less displaced
Recyclable?	Yes	Yes
VOC's?	None	None
Material per 1000 Ft ² *	143 Yd ³ (9 dump trucks)	10 rolls (1 pick-up truck)

* To get a 9 gal/minute flow rate, approximately a 4 foot thick wall of stone is needed, whereas a ¼” drainage mat can handle the same volume.

While true LCA data does not exist for prefabricated drainage media, one can see the inherent ecological benefits of prefabricated drainage over gravel on a functional unit equivalency due to the heavy equipment needed for excavation, transportation and installation of the traditional stone and pipe system.

The above is how to handle water in the ground. However, roofs also make up a significant area for rain to hit which is impervious. Many coatings used on rooftops now exist that are rated as suitable for potable water catchment. The coated surfaces are actually safe enough in terms of the chemistry they are made of that rain which hits them can be routed to a cistern and treated for use in potable applications. While not yet extremely common in North America, such systems are very common in The Caribbean and Middle East where potable water is scarce either due to a lack of ground water or salinity. Such coatings also have associated products such as detailing sealants and mastics that are also rated for potable water contact that help the system function properly while protecting the structure underneath.

So, through the effective use of prefabricated drainage and the proper coatings, one can reclaim much water that would normally “wash-away” and use it for non-potable applications, thus saving aquifers and preserving water.