



Dr. Thomas P. Ballestero, P.E.

Permeable Pavement: Through and Through

The path to system success

Permeable pavement systems are becoming more prevalent and better understood. Storm Water Solutions Managing Editor Caitlin Cunningham interviewed University of New Hampshire's Dr. Thomas P. Ballestero, P.E., to learn more about the technology's evolution and how to make the most of it.

Caitlin Cunningham: What is the latest in storm water-friendly pavement?

Thomas P. Ballestero: There have been great advances in asphalt, concrete and block technologies, primarily in response to the greater diversity of sites targeted for these types of systems. Some advances have been made due to failures. Very often the failures were directly linked to pavement material design, lack of construction supervision or inappropriate maintenance.

The advances in permeable pavement systems include the basic mix designs to improve strength and yet maintain high permeability as well as construction and construction practices. When systems are constructed in a region where previously they were not used, the subsequent implementation of the systems at other sites in the region is explosive due to media coverage and performance.

The underlayers are diversifying in response to the needs of structural support and storm water treatment—by, for example, including geogrids, contaminant-selective media or size distributions. Storm water management trends are focusing more on infiltration.

Cunningham: Describe the pros and cons of permeable pavement systems.

Ballestero: There are many pros. In cold regions, the surfaces have equal or better frictional resistance compared to impermeable surfaces. The darker-colored permeable surfaces often require little to no winter salt. There is no refreezing of

meltwater on the permeable surfaces in the winter. The quality of water leaving the bottom of permeable systems is generally better compared to the effluent from conventional best management practices. Water can be infiltrated to yield more water into the ground than predevelopment, even for low-percolation soils. Because the surfaces do not generate runoff, there is no need to use additional space for storm water management.

The biggest con is associated with the fact that with storm water management, there are no silver bullets. There are locations where permeable pavement systems should not be used, but that has not stopped some from trying. Another aspect is that people with limited system knowledge or experience are trying to design them.

The most intriguing con is the higher standard employed for permeable pavement systems compared to impermeable pavements. If an impermeable pavement fails, there are rarely significant industry consequences; however, if one permeable pavement system fails, then often many entities proximal to that failure consider all permeable pavements to be inferior.

Most basic permeable pavement designs do not effectively remove nutrients, and much has been made about the need for maintenance. We accept the use of catch basins and clean them once or twice per year without thinking it is onerous, yet the permeable systems possess better water quality and

hydrologic improvement with about the same amount of maintenance and for some reason this maintenance is considered a burden.

Cunningham: How can end-users maximize the pros and avoid or minimize the cons?

Ballestero: To maximize pros, stay plugged into the technical literature and go to specialty meetings. Talk to the manufacturers—many provide design and construction training. To avoid the cons, learn how to do it right, especially under the tutelage of someone who knows what they are doing.

Cunningham: Where is the world of storm water and pavement headed?

Ballestero: It is a phenomenal growth sector. I also see system designs offering selective media to remove targeted contaminants as well as treatment trains. As these surfaces age, more will be known about long-term performance, repair and resurfacing. SWS

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