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Five Questions With: Lorraine Joubert

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In any development project, planners, engineers and contractors must implement designs that steer rainwater away from homes and businesses while protecting the environment. For many years, the process was simple: send the water as far away and as fast as possible. But new standards released this year call for a different approach.

Now one of the people trying to get the word out is Lorraine Joubert, director of the University of Rhode Island Cooperative Extension Nonpoint Education for Municipal Officials Program. She recently took some time to discuss the changes.

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"ROADS, PARKING AREAS and other pavement associated with transportation generally account for about 60 percent of the impervious area associated with development," said Lorraine Joubert, director of the University of Rhode Island Cooperative Extension Nonpoint Education for Municipal Officials Program.

PBN: New stormwater design and installation standards came into effect this year. Without getting too technical, what are the important changes that local planners and engineers need to know?

JOUBERT: In a nutshell, the new stormwater standards completely reverse the way we've been dealing with stormwater, a major source of pollution to Rhode Island's waters, by moving stormwater management from a purely engineering exercise into the realm of local land use standards and early site design. The new approach – widely used and accepted as the industry standard in other states – is known as "Low Impact Development." This is a complete site planning and design strategy meant to avoid and reduce runoff from the start, then rely on small, often vegetated stormwater controls dispersed throughout a property to manage any unavoidable runoff.

In comparison, the conventional approach has been to quickly collect, convey and dispose of stormwater at large downhill basins. We now know that the combination of larger flows and pollutants is responsible for water quality problems throughout the state, including swimming and fishing areas previously considered clean.

For municipal planners, this means updating local zoning and land development to accommodate the new standards, often by allowing more flexibility in road widths, parking ratios, and other development standards. For engineers and landscape architects, it means integrating stormwater management into conceptual designs based on soil types and landscape features to mimic natural

water flow patterns. Even property owners will have a role to play as some of the smaller stormwater controls may be located on individual lots. To help restore water quality, the new rules will apply to both new construction and redevelopment projects.

PBN: What are some of the emerging techniques to comply with the changes?

JOUBERT: "Low Impact Development" uses a three-step process to reduce runoff: Avoid, reduce and manage harmful runoff impacts.

Avoiding and reducing include leaving natural drainage areas and wetland buffers intact, keeping the land disturbance footprint as small as possible rather than clearing the whole site, and reducing the amount of pavement and other hard, impervious surfaces to the maximum extent possible using methods such as narrower roads, smaller parking lots and shared driveways.

The last step, managing whatever runoff remains, uses new techniques to disperse and infiltrate runoff as close as possible to point where it flows from rooftops and driveways. This may be as simple as diverting roof gutters to vegetated areas; using rain barrels, dry wells and larger cisterns to store and recycle water; and creating small landscaped depressions to catch and filter rain water known as rain gardens. Porous pavements and green roofs may also be used. Lastly, any remaining runoff is then managed using engineered stormwater treatment systems. Remember, under the old standards this was the first step. These include open vegetated channels rather than drain pipes; improved designs for constructed wetlands known as wet-vegetated treatment systems; infiltration systems designed to get water back into the ground using basins, trenches and chambers; and larger, engineered rain gardens known as bioretention systems, which may be used in parking lot islands.

PBN: Are these techniques easy to learn from a book or do engineers and planners need to head to classes or conferences to learn all the details?

JOUBERT: Planners and engineers have been using the new techniques in projects throughout the state for years. Some of these examples are highlighted in our Rhode Island Stormwater Low Impact Development Inventory at www.ristormwatersolutions.org.

For example, these include use of porous asphalt and bioretention at the Metro East Office Park in Warwick and at the URI Ryan Center parking lots in Kingston; green roofs at the Gordon Avenue Business Incubator and Westminster Lofts Peerless Building, both in Providence; rainwater collection and recycling for indoor toilet flushing at Aidan's Pub in Bristol; and compact development designed with a variety of stormwater controls at the Browns Farm Drive subdivision in South Kingstown built 1999, and the more recent Cottages on Greene in East Greenwich.

That said, the new standards can be complex and introduces new permit review procedures so even state agency staff recognize it will be a learning process for all. To smooth the way, DEM, CRMC and DOT are holding ongoing training sessions for designers, municipal officials and other professionals. Since municipalities are responsible for avoiding and reducing runoff

through land development standards, DEM has already run several workshops specifically for planners and local officials on these topics.

PBN: What is URI's role in this?

JOUBERT: The URI Cooperative Extension has been working with the R.I. Departments of Transportation and R.I. Department of Environmental Management to help organize training in use of the new Standards Manual. This is one element of a statewide stormwater education and outreach effort known as Rhode Island Stormwater Solutions (www.stormwatersolutions.org) funded by RIDOT as part of its stormwater management program. DEM and most Rhode Island municipalities are partners in this effort.

Our goal is to help municipalities and other owners of small stormwater systems to meet education and outreach requirements of the DEM Stormwater Phase II permit program, as required by the U.S. Environmental Protection Agency. This statewide effort is much more cost effective than if each municipality were left on its own to create its own education programs and ensures consistent information statewide. The new stormwater standards manual is one part of this project.

PBN: I understand that the DOT is gearing up to comply with the standards for coming projects. Can you talk a little about what DOT is trying and why it's important that transportation projects consider stormwater management?

JOUBERT: Roads, parking areas and other pavement associated with transportation generally account for about 60 percent of the impervious area associated with development. All this asphalt on both state and local roads can have significant impacts to local water quality, especially when considering that studies show that it only takes about 10 percent average hard cover to harm stream water quality. And in sensitive trout waters, the threshold of impact is about 4 percent impervious.

So DOT staff will be planning to use the Low Impact Development concepts for future projects, both new construction and roadway reconstruction projects. We can expect to see more roadside open channels to convey and treat runoff; vegetated bioretention areas along the highway, and even simply replacement of pavement with low-maintenance vegetation. Where roundabouts are planned, as in South Kingstown on Route 138 and in Middletown, the center area may be designed to receive runoff using a bioretention area.

It's always a challenge to accommodate these features within a narrow area. In Middletown, DOT has partnered with the town and a private consulting firm to acquire land for a stormwater treatment system using a new type of constructed wetland that will be the first of its kind in Rhode Island. The new Rhode Island Stormwater Design and Installation Standards Manual is now considered to be the most progressive of all used in New England, and DOT will be leading the way to apply the new methods to future projects.