PROTECT YOUR

Turf management as a wet-weather strategy

By Darrell Smith

Extreme weather events are increasing in frequency and intensity. More than 10 trillion gal per year of polluted storm water runoff now flood neighborhoods and enter the nation's waterways. Many communities are responding by spending millions of dollars to retrofit their traditional engineered storm water solutions to manage this deluge. However, with municipal budgets strained and new storm water ordinances requiring more green infrastructure, municipal engineers are looking for alternative solutions to their storm water challenges, including sustainable turf management as a wet-weather strategy.

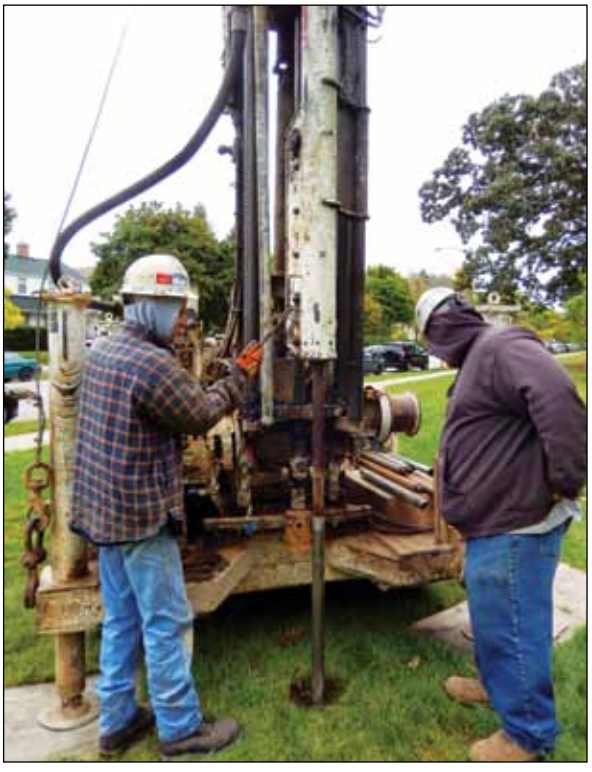
A Storm Water Asset

There are 40 million acres of turf across the U.S. and, as one of our nation's largest "crops," turfgrass is associated with the same issues as conventional agriculture. These issues range from the excessive fertilization that pollutes waterways to the high irrigation requirements that typically account for half of the demand on municipal water supplies.

The majority of the country's turf is represented by large landscapes, including athletic fields, golf courses, parks and playgrounds, which typically are compacted, with short root systems. These large turf fields can be sources of hard-surface polluted runoff contributing to neighborhood flooding and water quality issues.

A methodology from Earthcare, a Milwaukee-based landscaper and storm water consultant, seeks to change that. The company's Sustainable Turf technique converts turf from an environmental detriment to an environmental asset by focusing on building healthy soil. The methodology is chemical free and based on soil diagnostics and customized turf protocols. It can help provide improved storm water infiltration through root development that is two to three times deeper than traditionally managed turf. This deep root penetration allows the turf to be a better "sponge," holding storm water where it falls, reducing storm water overflows and improving water quality.

"Although traditional engineered solutions are critical to improve storm water management, it's a holistic approach—blending green with grey—that provides the most robust and cost-effective solution to our storm water challenges," said Henry Moss, director of marketing for Earthcare. "Sustainable Turf can complement existing storm water control plans and [allow] easier compliance with new storm water regulations, which often require holding the first inch of storm water [using] green infrastructure."



Workers perform subsurface exploration to confirm consistency of the control and managed test sites. Multiple 6-ft borings were drilled using an ATV-mounted drill rig.

Field Test

A 5-acre turf field comprising multiple athletic fields and picnic groves in Shorewood, Wis., known as River Park has served as Earthcare's best management practice model for six years. Recently, Earthcare contracted with Midwest Engineering Services of Waukesha, Wis., to perform a comparative infiltration analysis utilizing the ASTM 3385 methodology modified by the Wisconsin Department of Natural Resources for grass bioswales.

Midwest Engineering Services found that River Park has five times the infiltration capacity of Veteran's Park, a traditionally managed turf field with a soil profile (48% sand, 40% silt, 12% clay) that is similar to River Park's (40% sand, 48% silt, 12% clay).

Another analysis compared River Park with Estabrook Park, another traditionally managed turf field, which has a soil profile of 65% sand, 30% silt and 5% clay. According to the U.S. Department

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A worker prepares to insert the double-ring infiltration equipment per ASTM 3385 as modified by the Wisconsin Department of Natural Resources for grass bioswales.

of Agriculture's Natural Resources Conservation Service, soil like Estabrook Park's, with 25% more sand than River Park's, should have three times the infiltration capacity. River Park's infiltration, however, essentially was equivalent to Estabrook Park's as a result of River Park's deep root penetration and soil porosity.

This preliminary comparative analysis has been reviewed by engineering firm Mead & Hunt Inc. and it is projected that Sustainable Turf can develop excess water retentive capacity over traditionally managed turf. Mead & Hunt calculated that the turf's infiltration potential could be leveraged to allow hard-surface runoff from adjacent rooftops and streets to be routed onto a Sustainable Turf field during a rain event.

Earthcare is planning to take River Park's preliminary infiltration data to the next level and has partnered with the University of Wisconsin-Milwaukee and the Milwaukee Metropolitan Sewerage District with a formal three-year proof-of-concept pilot that began last September. There are two additional pilots planned to start in 2015, which will put into motion three independent pilots with a consistent study methodology.

"Based on River Park's increased infiltration rate, I would estimate that with Earthcare's methodology, there are tens of thousands of additional gallons of storm water that can be infiltrated through large turf landscapes with each significant rain event," said Perry Rossa, P.H., of Mead & Hunt. "The technical analysis [of the proof-to-concept pilot] will utilize both pre- and post-infiltration data, which will get us closer to fully understanding the technical value of Sustainable Turf as an unexploited green infrastructure opportunity." SWS

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