



Engineering Green Solutions to Stormwater Management

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Managing stormwater runoff from rooftops, roads, and other impervious surfaces to minimize its impact on waterways is a critical component of nearly every large-scale commercial, mixed-use, and residential development and redevelopment project in the District of Columbia. Typically, it's the project's civil engineer who takes the lead in compiling stormwater management options. At DC-based civil engineering firm [GordonDC](#), Managing Partner, Jessie Ponce de Leon, PE, is no stranger to the District's stormwater management requirements.

Ponce de Leon knows that the process of attaining compliance with District stormwater requirements isn't always straightforward, with each site presenting

About the Alternative Stormwater Compliance Program Uptake Initiative

Through this initiative, the District Department of Energy and Environment (DOEE), in partnership with the Urban Land Institute, seek to gain insight into current perceptions of, and experiences with the SRC and SISR programs in order to promote awareness and understanding of the programs, increase market uptake, and inspire more sustainable stormwater management throughout the District.

a unique challenge. Some projects afford engineers sufficient flexibility to install abundant green infrastructure (GI) elements that reduce stormwater runoff and protect local watersheds onsite while others demand more innovative solutions to meet regulatory requirements. This is where civil engineers that are knowledgeable about the District's options for stormwater management can save their clients time and money.

The District of Columbia's Department of Energy and Environment (DOEE) Stormwater Retention Credit (SRC) Trading and Stormwater Management Facility Self-Inspection and Self-Reporting (SISR) programs encourage construction and maintenance of GI.

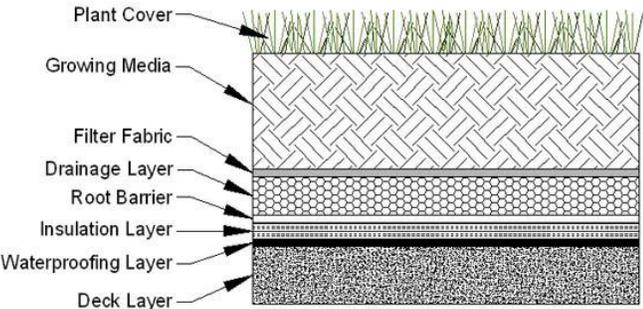


Photo: DOEE
Green roof typical

The SRC program allows developers and owners to buy SRCs in lieu of building onsite infrastructure. Together with the SISR program, the SRC program expands stormwater management options for large development and redevelopment projects, and gives architects and civil engineers like Ponce de Leon greater flexibility to help their clients achieve design and environmental goals.

Sites that trigger the District’s stormwater regulations can manage stormwater through on- and off-site options. On-site interventions could include installation of GI like permeable pavement, bioretention areas, or green roofs. For sites with characteristics that restrict the practicability of building GI onsite, SRCs can be purchased from landowners with excess stormwater retention capacity. Ongoing GI maintenance efforts conducted by site owners are then tracked through the SISR program, with civil engineers often involved as part of a facility maintenance team.



Photo: DC Public Library
Capitol View Library facade

LEVERAGING OFF-SITE GREEN INFRASTRUCTURE FEATURES

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Stormwater management is a critical component of large developments. Project engineers are well-positioned to communicate the range of possible options to developers and owners. “Some clients are really engaged in stormwater management and [know] what they want to do, while others are more [of the mindset that] ‘I’ve hired you as the professional,’” says Ponce de Leon. She adds that in either case, her role

in stormwater management as a civil engineer “is to assess the requirement and develop a plan for the [owner or developer] to meet the requirement.”

From Ponce de Leon’s experience, purchase of SRCs is becoming an increasingly common element of Stormwater Management Plans within the District. In one recent non-profit community education project in Southeast, SRCs proved to be the best alternative for a client working with tight deadlines and limited funds. In that case, despite the Client’s desire to implement sustainable infrastructure and practices, it was, “less labor-intensive and cheaper to implement the SRC program rather than to design and install green infrastructure,” says Ponce de Leon.

Several of Ponce de Leon’s other clients are also considering the use of SRCs. For instance, a District public library branch is exploring SRC purchase due to limited square footage for onsite green infrastructure. The branch may look to other properties owned by the DC Public Library that are generating SRCs to apply to their project, since the program allows owners of multiple properties to use credits from one property on another. “The client is much more on board now that they understand [the program] and see what a cost and ongoing maintenance savings it would be,” Ponce de Leon says.

Another project involving conversion of a historic hotel to senior housing was also limited by minimal space for potential onsite features at the ground-level, ruling out many typical green infrastructure solutions such as rain gardens and bioretention areas. Benefits of installing a green roof were weighed against costs of necessary structural reinforcements, relocation of mechanical equipment, and omission of rooftop amenities for residents. After assessing tradeoffs, the developer is considering SRCs as an attractive alternative.

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One common sticking point for developers and owners is potential price escalation of SRCs, Ponce de Leon says. However, she explains, the program allows purchase of credits for multiple years at today's price, and historical data back to the program's inception in 2014 shows that price fluctuations have been minimal. Developers and owners may also opt out of the program at a later date by installing onsite infrastructure if they choose. "You're not locked in for life," she says. Ponce de Leon adds that considering SRCs early on in a project can help cut back on design and construction costs as well as save precious time; reviewing and approving on-site stormwater management infrastructure can be a lengthy process.

Ultimately, the SRC program provides a greater range of choices for engineers and architects to guide their clients in meeting important environmental regulations. "We present a series of options for the client to use as a launching point for discussion. There are a couple of ways to meet the compliance requirements and this is what they require – we have a dialogue with the client to understand what they're open to and what they're definitely not open to," Ponce de Leon says. With the guidance of professionals like her, SRCs are inspiring more creative and cost-effective development outcomes throughout the District.

This case study was completed in collaboration with [GordonDC](#).