



Laboratory for

LID

A firm's headquarters employs multiple low-impact development techniques.

By Jay Landers

When Wetland Studies and Solutions Inc. (WSSI) decided to construct its new headquarters in Gainesville, VA, there was no question that the building and site would be developed in a manner that sought to limit untoward environmental effects, especially on an adjoining wetland and stream system. After all, the company—a consulting firm that specializes in water, natural, and cultural resources—is dedicated to fashioning ecologically responsible development. Ultimately, WSSI opted to showcase an array of low-impact development (LID) techniques for managing stormwater and environmentally friendly design and construction practices. The result is a veritable LID “laboratory” that the company hopes will contribute to the scientific understanding of stormwater management and inspire others to adopt similar approaches.

The various LID techniques employed on WSSI's 5-acre site are as ambitious as they are unnecessary. Because the property is served by an existing stormwater management pond, the company was not required to implement anything more than a traditional curb-and-gutter approach to managing stormwater. So why did WSSI choose to go beyond what was required of it? “Because it's the right thing to do,” says Michael Rolband, the firm's president. “Stormwater runoff in northern Virginia is typically controlled by stormwater ponds that regulate only peak flows. Over the past 15 years, we've seen significant stream degradation in channels above regional stormwater management ponds due to lack of any control, and almost as severe erosion in stream channels below stormwater management ponds due to the change in timing and the increase in volume of stormwater runoff from conventionally designed stormwater management systems.”

In terms of stormwater management at WSSI's headquarters, the “right thing to do” involved incorporating three different types of pervious pavement in the parking lot; constructing such features as a green roof, rain garden, underground cistern, water-quality swale, and gravel bed detention system to collect and filter runoff; and taking steps to avoid disturbing as much of the site as possible. Furthermore, extensive measures were taken during construction to control erosion and protect downstream resources from sediment.

Understanding LID

Often touted as a holistic strategy for managing stormwater, LID includes several basic tenets, among them conserving and protecting a site's natural features, minimizing impervious areas, directing runoff to natural areas that slow it down and enable evaporation or infiltration, and using many small-scale controls to reproduce the functions of natural areas. Such functions typically include infiltration, detention, retention, evaporation, and groundwater recharge. During site preparation and construction, LID calls for the use of measures to limit erosion and prevent soil compaction.

The upshot of such efforts is to mimic a site's predevelopment hydrology. Indeed, this was a major goal of WSSI as it set out to design and construct its new headquarters, which includes office and warehouse space. By using the various LID techniques, the firm aimed to

reduce the site's post-development curve number to its predevelopment curve number. And by increasing the site's storage capacity and its time of concentration, WSSI sought to minimize the effects that runoff would have on downstream water bodies.

Finally, the company aimed to prove that it could comply with Virginia's requirements for reducing pollutants in stormwater solely by using LID approaches. However, stormwater management was not WSSI's only goal. As part of an effort to certify its headquarters a "green building," the firm also incorporated numerous strategies to make the building environmentally friendly.



All photos: Wetland Studies and Solutions Inc.

An aerial view of WSSI's headquarters in Gainesville, VA

Retaining Runoff

Among the site's many LID approaches, the gravel bed detention system—also known as the underground detention system—is

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