

Anacostia Watershed Society Designs **SITES PILOT PROJECT** WITH VECTORWORKS LANDMARK

The Anacostia Watershed Society (AWS) is a non-profit environmental organization founded in 1989 whose mission is to restore the Anacostia River and its watershed communities. Since 2006, AWS has operated out of the historic George Washington House in Bladensburg, Maryland. This historic landmark (circa 1752) has survived the test of time located less than five miles from the U.S. Capitol and less than one hundred yards from the banks of the Anacostia River.



AWS' headquarters has seen dramatic changes since its circa 1752 construction.



Designed to manage stormwater and runoff, the new cistern and other drainage solutions will reside primarily on the grounds in front of this portion of AWS' headquarters, located behind the original house.

The George Washington House, also known as Indian Queen Tavern, has seen dramatic changes since its construction by tavern-keeper Jacob Wirt.

At the time, Bladensburg was a thriving port town, and the house was later rented to a Scottish mercantile firm that traded in tobacco. The house subsequently functioned as a stagecoach stop, an infirmary for British soldiers during the War of 1812, and a private residence. But when the Anacostia River silted up in the late 1800s, Bladensburg's role as a seaport ceased as larger ships could no longer reach the port. Also troubling for the town was its low-lying, flood-prone location, which made it a breeding ground for malaria. As the years progressed, heavy pollution in the Anacostia River, coupled with weak investment and development along its banks, led it to be called "DC's forgotten river." AWS' intent since its founding has been to change that perception through clean-up and recovery efforts.

This rich history, combined with a listing in the National Register of Historic Places, makes the George Washington House a unique headquarters location for AWS because it is a protected landmark within the Anacostia port-town communities in which AWS is deeply vested. When Landscape Architect Mary Abe, RLA, LEED AP, became an AWS board member prior to leaving private practice and joining AWS' Stewardship Team full-time, she learned of an AWS project to install a bioretention cell to handle the parking runoff. While the project was well-intended to filter and infiltrate stormwater runoff, Abe knew the solution was problematic because its location was planned under the drip line of an oak tree, as well as within a historic easement. Excavating for the bioretention device would have potentially killed the tree, and, as it turned out, would have disturbed significant archaeological reserves, which are now protected by the Maryland Historic Trust.

Simultaneously, the Sustainable Sites Initiative (SITES™) was seeking pilot projects following specific guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices. The specifications set forth in the SITES rating system eventually guided Abe and AWS to redevelop their site under the SITES guiding principles. The project would allow AWS to celebrate the history of

the site while striving to create an outdoor space that embraced the principles of sustainable development and best management practices. The project was accepted as a SITES pilot project, and AWS will apply for a Three-Star certification in the spring of 2013, after the project is fully installed.

Walk the Talk

AWS' SITES project is redeveloping the historic grounds of the George Washington House by following SITES benchmarks, which encourage designs that honor pre-development infiltration rates. To achieve this goal, they will remove impervious surfaces and replace permeable systems, honor the site's heritage by minimizing excavation, and recreate habitat through native planting. Additionally, economical and aesthetic sustainable site development will provide education and demonstration opportunities on-site for AWS' staff to teach others about stormwater and runoff issues, as well as solutions.

"You have to walk the talk," says Abe, referring to AWS' push for sustainable stormwater management and landscapes. "Unless we do the walk, we can't talk the talk, so this project demonstrates how to reduce runoff through low impact development [LID] elements yet create an aesthetically pleasing space that still incorporates all the desired land uses."

Abe's plan for the site, designed completely with Vectorworks® Landmark software, celebrates, yet tames, stormwater runoff—even in the smallest of ways. Before any construction could start, however, AWS needed to understand the site from an archaeological and historical perspective to evaluate the most appropriate LID



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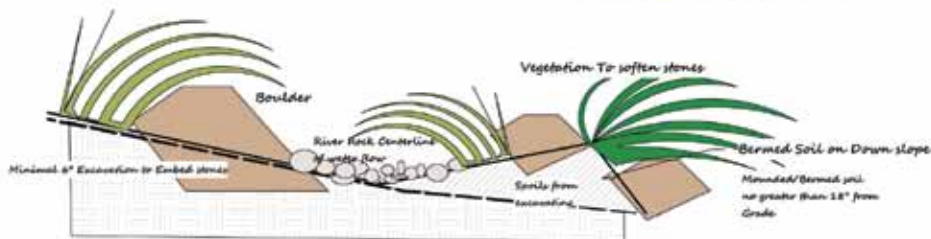
elements to incorporate. So a Phase II Archaeological Investigation and an as-built survey were performed as part of the site analysis prior to design. Utilizing Vectorworks Landmark, Abe then imported the survey data, which was in a DWG file format, and explored multiple design concepts, which also responded to the challenging benchmark criteria set by SITES.

"As much as we wanted to maximize the space, we learned to live with less," says Abe, noting that the house and site's protected historic status meant the ultimate design couldn't include solar panels, above-ground cisterns, or aggressive infiltration techniques. Excavation has also been limited because eight inches below the surface lies a mix of concrete and asphalt from what was once a parking lot when the site served as a liquor store in the 1900s.

Another challenge was existing site drainage. The house essentially sits in a bowl from years of state road vertical and horizontal



The house currently sits at an elevation below the road due to years of horizontal and vertical road realignments. Addressing the resulting negative drainage problem is central to this and future projects. The photos show before and in-progress views.



**SHEET 11
AWS MHT SUBMISSION
SITE DETAILS**

Details such as this dry stream bed illustrate how AWS will create a natural looking channel for water drainage and runoff.

realignments that practically place the road on the footsteps of the house's front porch. To address the negative drainage patterns, two different permeable paver systems will be used for the walkways, as well as two underground cisterns. The cisterns will eventually harvest and store nearly 2,000 gallons from roof runoff, which will be used to water native plantings and serve as a source for a water feature.

The selected cistern system doesn't require extensive excavation, which was a requirement AWS agreed upon with the Maryland Historic Trust not to disturb below a certain elevation. Harvesting water off the facility's roof, the cistern can fill up with less than a one-inch storm event. Overflow from the cistern will splash into a small water feature, which will continue into a meandering dry stream bed under a bridge to emulate the flow of natural water. This water will then feed an existing rain garden.

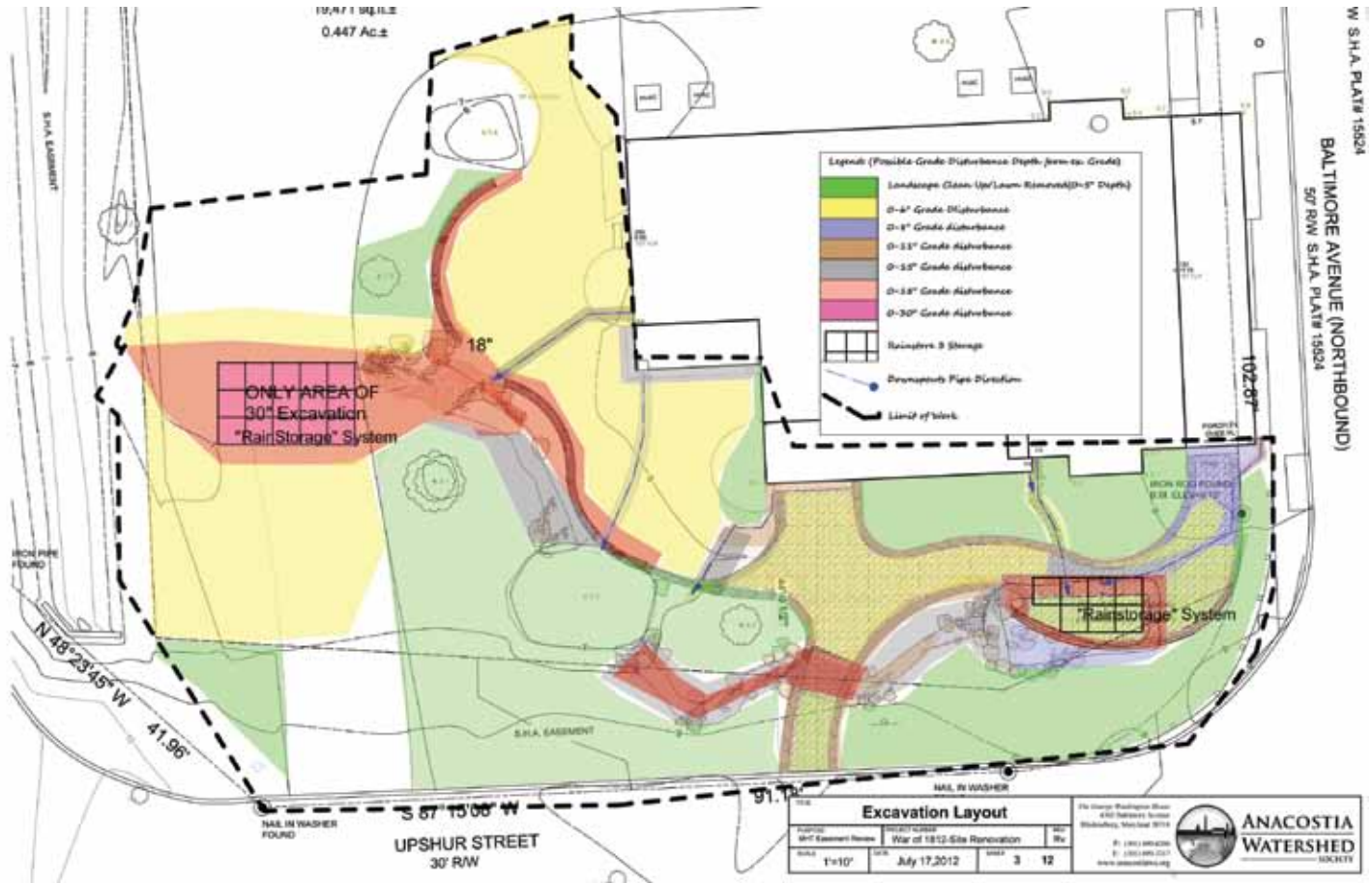
"We strove for a zero runoff impact, but due to subgrade constraints, that simply wasn't possible," says Abe. "Water that doesn't infiltrate the site will eventually flow into a roadside swale and then into the Anacostia River. But the volume will be reduced significantly with vastly improved water quality than our previous situation."

In addition, all soil from excavations has remained onsite for reuse. Rubble from walk removals and stones from past parking curbing were reused to build a 50' seat wall and stone entry bridge. An EZ Roll Gravel Paver system and Pine Hall Permeable Clay pavers will be used as the permeable walkway system and make the site ADA-accessible.

The final phase of the project will involve removing all lawn from the site and replacing it with pollinator-friendly native meadow plantings. While the project's retail cost is between \$65,000 and \$75,000, generous donations, matching funds, volunteers, and a \$37,000

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The excavation plan identifies the levels and depths of permissible digging areas upon the site while also identifying new hardscape areas to be constructed. Such plans are important in understanding the scope of work and confirm AWS' sensitivity to the site.



Work is in progress to prepare the site for the cistern and drainage solutions.

grant from the Maryland Historic Heritage Area will just about pay for all costs. Installation work began after this funding was secured in September 2012.

Using Vectorworks Landmark

In addition to outside funding and volunteerism, Abe points to Vectorworks Landmark as a critical tool that brought her design together. "When you're a grassroots organization, and then you have this landscape architect—me—who says a design should be executed with CAD software, it can be challenging to get others to understand," she says. "This is especially true when working in 2D because non-designers don't always see the volumes of work embedded in a plan, including layers/classes, views, cross-sections, and details."

But the benefits are clear for Abe, who enjoys the software's ability to design and tabulate at once, import and export other file formats, and create multiple arrays of bricks. She also points to its easy-to-use interface. "We have a lot of interns who weren't previously exposed to Vectorworks," she says. "So we're training students to use the software to create greater synergies among them, employees, and volunteers."

Abe contends that the Vectorworks Landmark program will assist AWS in its dealings with local governments and everyday citizens at town hall meetings to help educate the public on sustainable practices. Already, AWS Water Quality Specialist Masaya Maeda completed training and plans on using the software to design trash traps for tributaries feeding the Anacostia River. Abe also hopes that the software can become part of the curriculum for the AWS-sponsored Watershed Stewards Academy, a multi-class initiative that teaches adult students how to identify and implement potential improvements to existing stormwater management practices within their own communities.

Abe looks forward to expanding her 3D presentation, detailing, and rendering skills in Vectorworks software to better demonstrate the value of this SITES project. This way, anyone, regardless of their industry focus or education, can see firsthand and clearly understand through a 3D representation the plans AWS put into place to effectively demonstrate and animate an effective water plan.



A team of Nemetschek Vectorworks employees volunteered some time working on AWS' pilot project and wrapped up the day with a relaxing boat ride along the Anacostia River. Shown here is Architect Product Specialist Jeff Server.

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What happens after the project's completion won't likely be small, for these Anacostia River advocates have big plans. "AWS will continue to be the voice of a river once forgotten," says Abe. "The Anacostia will never be a pristine waterway, but if we can find a happy medium where man and biodiversity work together, then the river will be a clean and healthy place to live and visit once again."

Acknowledgements

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