



2010

Top Storm Water & Erosion Control Projects

Brought to you by *Storm Water Solutions*

Even in a tough economy, storm water and erosion control professionals continue to invest in, design and execute innovative new and redevelopment projects. Now in its third year, *Storm Water Solutions'* (SWS) Top Storm Water & Erosion Control Projects program recognizes the industry's finest work.

In this special section, our editorial staff presents summaries and photos illustrating an impressive array of initiatives. The list of 2010 winners includes projects that address flood control, runoff treatment, water quality monitoring, soil erosion and sediment control, and various combinations thereof.

Nomination & Selection Process

SWS called for and accepted 2010 Top Storm Water & Erosion Control Projects nominations from June through August, and the response was strong. To be considered,

projects had to have been in a design or construction phase within the past 18 months.

The editorial staff selected winners based not on projects' size or cost, but rather the challenges faced and the ingenuity and success of solutions implemented. **[SWS]**

For more information, contact the *Storm Water Solutions* editorial staff at swseditor@sgcmail.com or visit www.estormwater.com/lm.cfm/st111003.

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Cascade Park

Cascade Park is more than an urban Tallahassee, Fla., storm water management facility: It is a formerly contaminated and fenced-off public works site that will be transformed into a 24-acre, world-class green space. One of several projects slated to collect and treat storm water in a 1,030-acre watershed, the park will include two wet ponds connected by vegetated wetlands, which together will treat up to 70% of the watershed's annual base flow and runoff. A bypass culvert directs 20 cu ft per second (cfs) to 325 cfs of water downstream, with up to 98 acre/ft of excess water stored in the park.

Several years ago, a U.S. Environmental Protection Agency-mandated review and remediation initiative required multiple agencies to remove contamination stemming from the site's historical uses (e.g., as a coal gasification plant and an incinerator). After acquisition of the 48 construction permits needed from 11 agencies, the final site revamp began in July 2010.

Workers used earth-moving equipment by Ditch Witch, Komatsu, John Deere and Caterpillar to clean up remaining pockets of contamination and implement the project's design elements. Located at the bottom of a "bowl" to which much of central Tallahassee's runoff drains, the park now will slowly back-flood from its lower pond to reduce erosion and keep area residences and businesses dry. Completion of Cascade Park is scheduled for July 2012.

"Any project that takes a superfund site and transforms it into a major storm water and water quality facility, and also provides a major park for our citizens, is a testimony to the imagination of the designers and to the vision of our citizens and elected officials," said Jim Davis, executive director of intergovernmental agency Blueprint 2000.



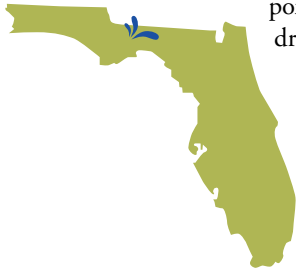
Cost: \$22.9 million

Size: 24 acres

Designer: Genesis Group

Contractors: Sandco Inc.; Pinnacle Construction Support; Crosspoint; Hawthorne

Owner: City of Tallahassee, Fla.



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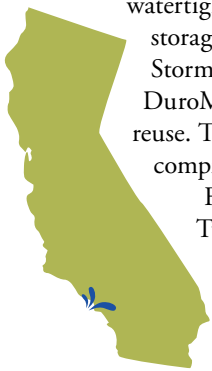
Alta Vista Park Diversion & Reuse Project

Urban storm water runoff is southern California's enemy No. 1 in terms of coastal water pollution. To protect its beachgoers, comply with Regional Water Quality Control Board storm water pollution reduction requirements and conserve the region's scarce water supply, in February 2010, the city of Redondo Beach, Calif., undertook the Alta Vista Park Diversion and Reuse Project.

"The city council has been very proactive regarding water quality and green development," said Mike Shay, principal civil engineer with the city of Redondo Beach. "Their support has given the staff the incentive to think outside the box and to come up with innovative projects that protect the bay and our valuable resources."

The park's storm water facelift called for a four-phase rainwater harvesting system made up of two treatment systems and two storage cisterns. Contech Construction Products Inc. provided the system's main parts: A CDS system pretreats runoff, a watertight DuroMaxx storage system contains some 20,000 gal for buffer storage to optimize the amount of rainfall that can be diverted, a pair of StormFilter precast vault systems to remove fine pollutants and a final DuroMaxx tank to store more than 123,000 gal of water for irrigation reuse. The system exists underground to maximize the tight space comprising Alta Vista Park.

Flygt USA pumps are used to divert the rainfall and American Turbine pumps and a hydropneumatic tank are used to maintain water pressure and flow rates in the irrigation water supply system to meet demands, and a reduced-pressure double-check backflow preventer protects against cross-contamination.



Cost: \$2.2 million
Size: ~15,000 sq ft
Designer: Mike Shay, City of Redondo Beach, Calif.
Contractor: Rick Rustad, Mehta Mechanical Co. Inc.
Owner: City of Redondo Beach

City of Kissimmee Water Quality Monitoring Project

Beginning in October 2005, the city of Kissimmee, Fla., set out to monitor its storm water quality in order to improve the condition of Lake Tohopekaliga and mitigate area flooding. Twenty monitoring stations have been established. In order to differentiate between the quality of water entering versus leaving city limits, they are located within the city, at exterior boundaries and prior to discharge into Lake Tohopekaliga. Rainfall measurements, too, are recorded at each station for the purpose of identifying, addressing and maintaining flood hazards.

"The city of Kissimmee took the initiative to implement a storm water monitor program to proactively address water quality issues within the city's six drainage basins rather than relying on models based on land-use coverages," said Kissimmee Storm Water and Development Review Committee Manager Lawrence M. Clough, P.E.

Working around Florida's climate proved to be a challenge during the initial phase of construction. The in-house design time and contractors also had to integrate various types of instrumentation: technologies from YSI, SonTek, Sutron and Teledyne Isco. To date, they have succeeded in maintaining a productive schedule and overseeing communication between stations.

The public may access Kissimmee's Water Quality Monitoring Project data—including site-specific temperatures, rainfall and water velocity—via the city website. The project is ongoing, with retrofits and upgrades underway.



Cost: \$3.8 million
Size: N/A
Designer: City of Kissimmee, Fla., Stormwater Engineering Department
Contractors: AMJ; Sutron; DHI; CDM
Owner: City of Kissimmee, Fla.

Rock Creek LID Study

As one of the fastest-growing areas in the state, Johnson County, Kan., is experiencing a large amount of redevelopment. The city of Mission, located in the Rock Creek watershed, knew that its aging flood control infrastructure and high percentage of impervious surfaces adversely affected local water quality. In order to improve water quality and sustainability, and to comply with the National Pollutant Discharge Elimination System, the city turned to Black & Veatch Corp. to help it identify and prioritize stream restoration projects and best management practices (BMPs).

Black & Veatch, along with Patti Banks Associates and a team of engineers, planners, landscape architects, environmental scientists, developers and economists, developed interactive documents to help the city plan sustainable storm water solutions. The Rock Creek Watershed Planning Final Feasibility Report identified and prioritized creek restoration projects and BMPs, and the Alternative Futures Study analyzed life-cycle costs, returns on investment and water quality for both traditional and low-impact development.



Black & Veatch also created an interactive database that uses the documents to prioritize restoration projects based on cost and field assessments. The database uses an automated multi-layer ESRI ArcGIS-based model to find the best locations for BMPs in the county. The GIS application allows both the city and county to update and use stream condition scores, land characteristics, prioritized stream projects and photographs to recommend storm water solutions to any proposed developments.



Cost: \$312,000
Size: 5.16 sq miles
Designers: Black & Veatch Corp.; Patti Banks Associates
Owners: City of Mission, Kan.; Johnson County, Kan.; U.S. Army Corps of Engineers

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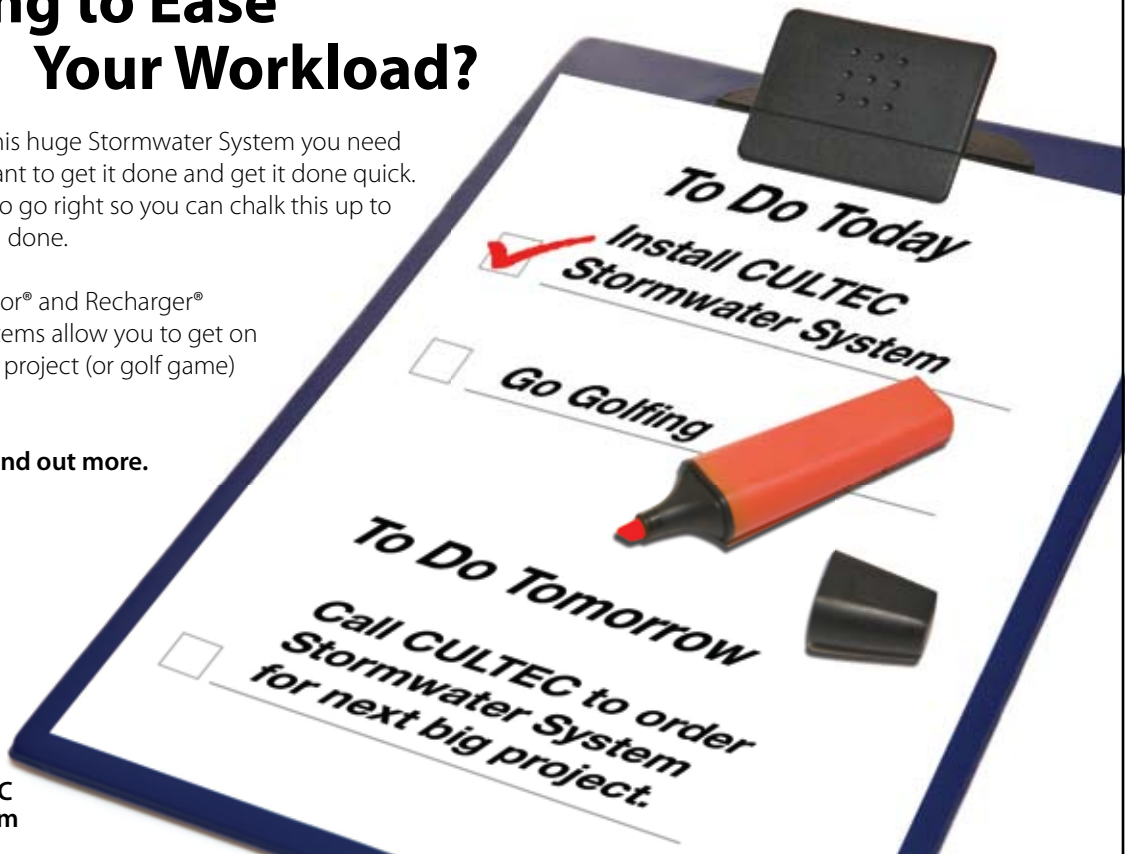
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Pigeon Creek Flood Mitigation

For years, downtown Thiensville, Wis., has battled chronic flooding, including four major events declared presidential disasters since 1973. Area flooding has closed streets, damaged homes and businesses, lowered property values and stalled economic redevelopment. In 2006, the Federal Emergency Management Agency (FEMA) awarded the village a more than \$1.7-million grant to support \$3.2 million in flood mitigation projects, including the widening of an unaccommodating stretch of Pigeon Creek.


Two undersized 6-ft-diameter culverts that obstructed the flood flow and acted as a barrier to fish were removed and replaced with a 50-ft-wide bridge across a commercial parking lot. Floodplain easements were obtained upstream to create 58 acre/ft of storage, which reduced flood flows by 5%. Workers removed fill and sediment that had been placed in or accumulated in the floodplain, increasing Pigeon Creek's flood-carrying capacity. The project team installed banks made up of geotextile-wrapped soil lifts on site. These soil lifts, stacked vertically up to 5 ft tall, were constructed using native seeded soil wrapped with two layers of 100% coconut-fiber fabric. Ultimately, the restored creek has provided a healthier environment for aquatic life, and fish spawning upstream in the watershed has improved. Project completion is scheduled for December 2010.



Cost: \$3.2 million
Size: 1,700 ft of creek restoration; 58 acre/ft of flood storage
Designer: Ruekert & Mielke Inc.
Contractors: Payne & Dolan Inc.; Vista Design and Construction LLC; Henry R. Marohl Inc.
Owner: Village of Thiensville, Wis.



The total cost of the Pigeon Creek Flood Mitigation project represents more than Thiensville's annual budget, but with the FEMA grant and Tax Incremental Finance District financing, the village was able to make the community improvements with no impact to property tax rates.

"It's very rewarding to see this project completed from an idea we conceived over 25 years ago, which will help Thiensville redevelop their downtown," said Mike Campbell, senior project manager with Ruekert & Mielke Inc. 







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Florence Storm Channel

When a sharp turn in a storm channel stream in Florence, Ky., started to erode homeowners' yards, the city knew it needed to find a solution before the erosion caused any major damage. Because the 10-ft-high streambank was in a highly visible residential area, the city had some specific goals: Not only did the solution need to be strong enough to withstand swift water and scour, it also needed to be aesthetically pleasing, with as little damage to yards as possible.

The city worked with manufacturer Redi-Rock Structures of OKI and engineers from Viox & Viox and H.C. Nutting/Terracon to design a wall that fit its needs. Construction of the 4,800-sq-ft wall began with a reinforced concrete footer to ensure its ability to withstand high water speeds and scour. The base was topped with two courses of 60-in.-deep bottom blocks, followed by 41-in.-deep blocks. To allow proper drainage, the storm channel was backfilled with crushed stone. General contractor Dudley Construction Co. topped the wall, which reaches 13.5 ft at its highest points, with a decorative metal fence.

Redi-Rock of OKI worked closely with installer Redi-Rock of Kentuckiana on time production and shipment so that the project took only two weeks to install. Little excavation was needed, and the city was able to keep residential disturbances to a minimum.

"The ability to construct the wall without geogrid reinforcement was critically important to this project," said Justin M. Verst, P.E., of Viox & Viox. "The construction space was tight."

The project specified LedgeStone texture blocks to give the wall the attractive look the city desired. Further plans include adding landscaping to the area to make it as visually pleasing to residents as possible.



Cost: \$254,600

Size: 4,800 sq ft

Designers: Jeffrey R. Barrow, P.E., LEED AP; H.C. Nutting/Terracon; Viox & Viox Inc.

Contractors: Redi-Rock of Kentuckiana; Dudley Construction Co.

Owner: City of Florence, Ky.



Congratulations to the *Florence Storm Channel Project*, winners of the 2010 Storm Water Solutions Top Projects

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Developers chose Redi-Rock for these headwalls because the massive size of each Redi-Rock block allowed them to build the top 9 feet of the headwalls as gravity structures to accommodate utilities. The headwalls will be finished with coordinating LedgeStone columns and caps in late 2010.

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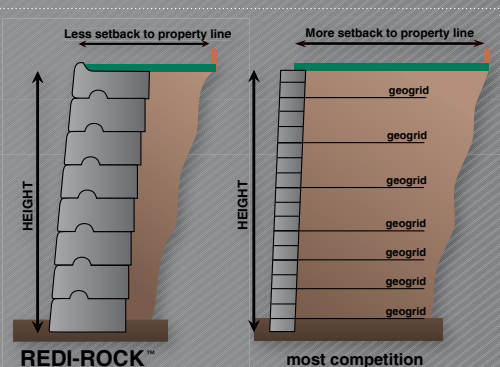
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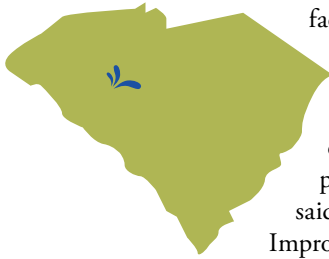
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I-385 Rehab

The I-385 rehabilitation project in South Carolina involved refurbishing 14.5 miles of roadway and applying erosion control products to 304 acres of land. Construction plans also included laying 10 in. of concrete, widening the roadway, raising six overpass bridges and replacing a flyover bridge.

I-385 is an important connection between the cities of Charleston, Columbia and Greenville. Because the construction plan required closing one direction of the highway to traffic for the first time in South Carolina's history, the state allowed only eight months to complete the project, which normally would take two years.

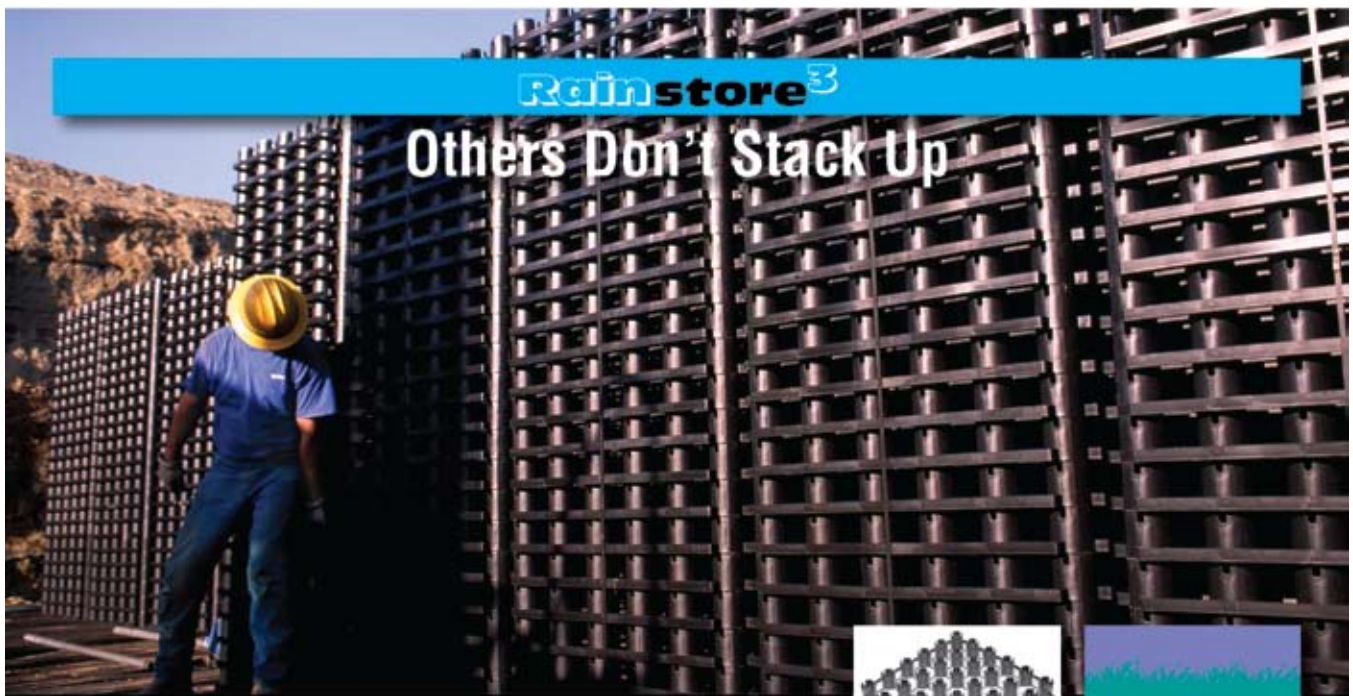
The project used Profile Products' Flexterra FGM and Flexterra HP-FGM to meet the South Carolina Department of Transportation's new hydromulch specification for fiber-reinforced matrix. Application was completed in a two-step process. First, a full acre was sprayed with seed, fertilizer and Profile's Prescriptive Agronomic Formula. Then, one-third of an acre at a time was capped with Flexterra using a 3,300-gal hydroseeder. With this process, the contractor was able to complete 4 to 5 acres per day.



In addition to the time constraints, the project team faced the challenge of working through heavy springtime downpours and around two dozen streams in the construction area. "Enduring three snowstorms, two 25-year rain events and over 130 days of measurable precipitation in a short 270-day project duration made for disastrous conditions," said Head Project Manager Nick Wolf of McCarthy Improvement Co., the project's contractor. 





Cost: \$60 million
Size: 304 acres; 14.5 miles of road rehab
Designer: Mark Hammond, South Carolina Department of Transportation
Contractors: McCarthy Improvement Co.; ACF Environmental; Woolpert
Owner: South Carolina Department of Transportation



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City of Los Angeles Rainwater Harvesting Pilot Program

Storm water runoff reduction is a huge challenge and priority for many cities, and Los Angeles is among those investigating alternative hydromodification solutions. One such solution is the ability to change storm water from a liability to a resource. In March 2009, the city launched a pilot rainwater harvesting program in the Ballona Creek Watershed that aimed at doing just that.

Volunteer citizens and business owners came together to make valuable use of rainwater: Nearly 600 homes installed a rain barrel, and seven commercial facilities were retrofitted with biofiltration planter boxes. Los Angeles engaged the public in its Rainwater Harvesting Pilot Program with a multifaceted outreach campaign. Using a brochure, website, Facebook page, e-mail updates and blog posts, for example, city officials engaged early adopters to champion the program, serving as spokespeople in media interviews and recruiting sign-ups.



“The program accomplished far more than just successfully placing the rain barrels that were given out,” said Sherri Akers, a community organizer and resident participant. “It created a buzz across Los Angeles that made getting a rain barrel the cool thing to do. The Santa Monica Bay will be a lot cleaner thanks to the rainwater harvesting program.”

The city wrapped up its pilot program in June 2010. It was oversubscribed by 500%, and participant surveys showed a significant willingness to adopt more onsite sustainable water practices such as rain gardens and additional rain barrel installations. Los Angeles currently is pursuing funding to expand the rainwater harvesting program citywide.



Cost: \$1 million

Size: 19.6 million sq ft

Designers: Malcolm Pirnie Inc.; S. Groner Associates Inc.; California Watershed Eng. Inc.

Contractors: Chicago Rain Barrel LLC; The Rain Barrel Co.; The Gutter Guy

Owner: City of Los Angeles Public Works, Bureau of Sanitation, Watershed Protection Div.

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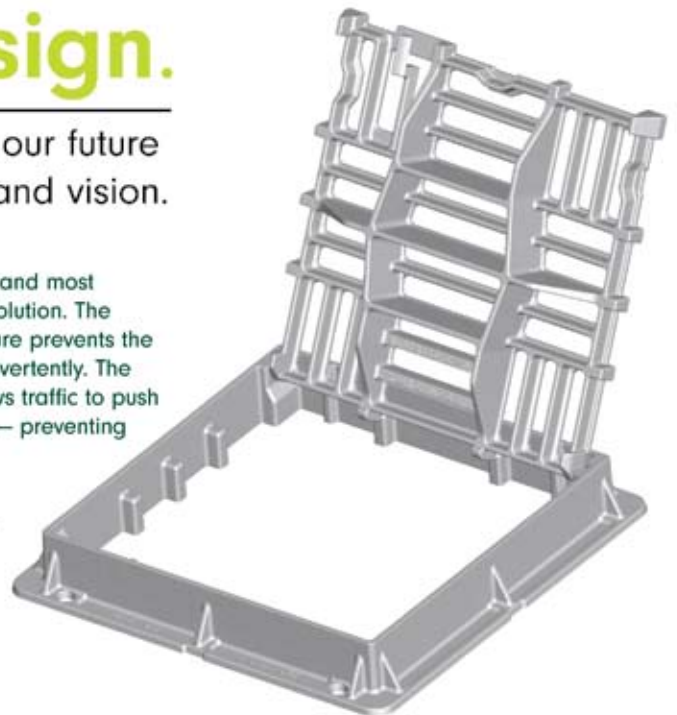
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Talbot Avenue Improvement Project

In August 2009, the Sonoma County Transportation Authority (SCTA)—on behalf of the California Department of Transportation (Caltrans) District 4—funded a highway runoff mitigation project in the city of Santa Rosa, Calif. The project partially fulfilled the storm water treatment and hydromodification control requirements for Highway 101 widening projects in Sonoma County.

The Talbot Avenue Storm Water Quality Offset Improvement Project constructed two bioretention tree well systems designed to treat storm water runoff as well as two hydromodification control systems. The tree well units, custom-manufactured by Filterra Bioretention Systems, house filter media in underground concrete containers; the media capture storm water pollutants, which are decomposed, volatilized and incorporated into the filter media biomass. Treated flows are routed to underdrains that discharge into the hydromodification control systems (perforated underdrains backfilled with permeable media).

Manhole covers for the tree well units were designed to describe the storm water quality enhancement system and acknowledge the partners involved: City of Santa Rosa, Caltrans, Sonoma County Transportation Authority (SCTA) and North Coast Regional Water Quality Control Board. The storm water quality improvement, part of a larger multi-objective capital project, was completed in August 2010.

“This is the first offsite water quality improvement project that Caltrans and SCTA have funded to offset storm water treatment and hydromodification control requirements on a highway project,” said Hardeep Takhar, Caltrans District water quality program manager. “[It] is an excellent example of using a watershed-based approach to partner and efficiently deliver a regional water quality improvement project.”



Cost: \$200,000
Size: ~1,000 sq ft
Designer: Coastland Civil Eng. Inc.
Contractor: Fedco Construction Inc.
Owner: City of Santa Rosa, Calif.



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I-595 Shared-Use Drainage Project

When the Florida Department of Transportation (FDOT) commenced a \$1.2-billion reconstruction of I-595 in highly urbanized Broward County, Fla., officials sought a cost-effective, sustainable solution for treating and attenuating storm water from the 10.5-mile-long construction zone. The drainage project required that a treatment volume of approximately 180 acre/ft be designed, permitted and implemented within a limited right-of-way—and on an aggressive schedule.

In April 2008, FDOT and RS&H approached three privately owned golf courses adjacent to the I-595 corridor, ultimately establishing right-of-way agreements and construction plans for shared-use storm water management systems. With the assistance of golf course architects, the golf course owners and project team developed final designs that expanded the golf course ponds and upgraded storm water conveyance infrastructure while significantly improving the playability and aesthetics of the courses. The construction enhancements benefited all involved parties.

Moving Water Industries dewatering pumps, Caterpillar earth-moving equipment, John Deere scraper tractors, Vermeer trenchers, a Ford box-blade tractor and a JCB dump truck were among the technologies used in completing the work.

Signature Golf Design Inc., Kipp Schulties Golf Design Inc. and JCM Group Inc. provided architectural services.

“We strongly believe that this project truly demonstrates itself as the industry model in the use of innovative water resource management for transportation projects and provides significant future value to the engineering profession,” said FDOT District 4 Drainage Engineer Francis Lewis.

The I-595 Shared-Use Drainage Project was completed on time and under budget, and the overall road reconstruction project continues to proceed on schedule.



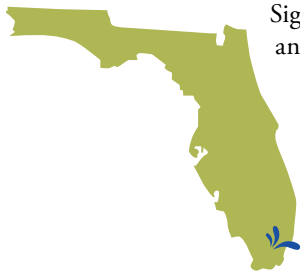
Cost: \$17 million

Size: 2,100 acres

Designer: RS&H

Contractors: QGS Development Inc.; Total Golf Construction Inc.

Owner: Florida Department of Transportation



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