# Flood Of Possibilities

Transforming Columbia's MLK Park from nuisance to attraction

#### **BY TREVOR GAURON**

olumbia, S.C., planners have been actively addressing water-related issues since the city's inception in 1786. According to history, the first streets were designed to be between 100 and 150 feet wide to evade mosquitos, which were believed would die of starvation if they had to fly more than 60 feet. Another historic anecdote relates how one of the city's main streets was initially paved with wooden blocks, which routinely (and humorously) floated away during heavy rains.

More than 230 years later, the city's streets remain comfortably wide due to that pesky, water-borne insect and, thankfully, have been paved to no longer float away in the still stormy Southeast.

The renovation of Martin Luther King Jr. (MLK) Park has followed a similarly constructive path. The downtown park is located near Five Points, a thriving entertainment district in a highly urbanized area. Flooding in the Five Points area has been a highly visible issue, as overflow from the nearby Rocky Branch Creek routinely causes damage to local businesses and residences.

MLK Park serves its surrounding community in multiple capacities. It is predominantly a passive park, with a softball field, community center, playground, and an extensive open area to host softball tournaments, outdoor concerts, festivals, and social gatherings. AN EXTENSIVE RENOVATION OF MARTIN LUTHER KING JR. PARK CONVERTED THE FLOOD-PRONE SITE INTO A BEAUTIFUL COMMUNITY PARK NEAR DOWNTOWN COLUMBIA, S.C.



DETENTION PONDS WERE INSTALLED AND VEGETATION WAS PLANTED IN THIS REGION OF THE PARK TO MAXIMIZE POLLUTANT UPTAKE AND PROVIDE INCREASED WATER QUALITY AND QUANTITY BENEFITS.

The park also has a large, open field that offers plenty of outdoor, aesthetic green space for the community to enjoy. However, over the years, the low-lying areas closest to Rocky Branch had become virtually unusable due to frequent flooding and extended periods of saturated soil.

In 2018, to address these flooding issues and enhance the appearance and purpose of the park, the city contracted with Woolpert to design and construct an "off-line," dry detention area to assist with stormwater attenuation. The goal of the project was to increase the overall stormwater storage capacity within the park, slow the velocities within the stream during storm events, and provide for pollutant trapping within the new storage areas, while extending the park's functionality and benefits to the region.

### LAYING THE GROUNDWORK AND NAVIGATING CONSTRUCTION

MLK Park is located in a low- to moderate-income area and provides one of the few venues for the community to gather and enjoy the outdoors. Therefore, it was important that the design not only alleviate flooding but also provide an improved and more functional space for the region.

In October 2017, before official plans were drawn for the renovation, the city held a community-outreach meeting at the park. The meeting was intended to educate residents about proposed park improvements and to solicit feedback as to what they wanted from the site. Through this process, the city learned that retaining green space, providing access to Rocky Branch Creek, and facilitating the consistent use of the park's amenities was of paramount importance.

The city then worked with Woolpert to create a design that included the following features:

An underdrain system to facilitate the use of areas that traditionally remain wet long after rain events

■ Multiple detention areas to help reduce flooding in Five Points and to promote increased water-quality benefits

A boardwalk to provide a safe path and lookout area along Rocky Branch Creek

■ Vegetation to maximize pollutant uptake, while providing increased water-quality benefits.

When construction began in 2018, fencing allowed the public to continue to enjoy the functioning areas of the park throughout the construction process.



RAINFALL OF ANY SIGNIFICANT AMOUNT WOULD ROUTINELY TURN THIS AREA OF MLK PARK INTO A VIRTUALLY UNUSABLE SPACE.

Project management focused on sequencing of the major activities, administration of the construction project, fabrication and installation of the boardwalk, design and construction of the retaining wall, and oversight of the landscaping activities. Because construction was in an area subject to heavy flooding, weather had a significant impact on work progress and material storage.

During the construction of the three detention ponds and the raised boardwalk, the primary contractor, LAD Corporation, conducted weekly safety briefings on-site. LAD Corporation's effective safety program, with barriers, signage, and general public awareness by construction personnel and equipment operators, provided a safe work environment, which resulted in no lost-time injuries.

Environmental considerations also were integral to the project, specifically for the portion of Rocky Branch that flows through the park. Sediment- and erosion-control measures ensured that the stream was not adversely impacted by construc-

#### SEDIMENT- AND EROSION-CONTROL MEASURES WERE TAKEN TO ENSURE THAT ROCKY BRANCH WAS NOT ADVERSELY IMPACTED BY CONSTRUCTION ACTIVITIES.

tion activities. Rain events over the course of the project caused the stream stage to rise and the stream to inundate portions of the project area. Inundation became frequent due to the large quantity of rain events, occurring even with small amounts of rainfall.

Once detention-pond outlet piping and control structures were installed, there were frequent backwater impacts, due to flow from the adjacent portion of Rocky Branch into the detention ponds while they were still under construction. During certain phases of work, the detention-pond outlet structures had to be plugged to prevent the impact of backflow from the stream.

While the outlet structures were plugged, pumps were installed to manage on-site runoff that could not discharge to an adjacent stream via gravity flow. Additional measures were employed to protect the site, and the frequent inspection of controls was necessary to maintain compliance and meet the goals of the project.

Significant rainfall events exceeded the capacity of the control measures and required design engineers to address concerns related to the boardwalk structure. As a precautionary measure, earth anchors were used to secure the boardwalk to the ground and prevent the structure from moving during high-flood events.



Water-quality benefits from the increased detention were at the forefront of the design. The small detention pond and wetland area located closest to adjacent Greene Street acted as a forebay to slow the velocity of the stormwater runoff and allow sediment to deposit before entering the larger detention pond and finally Rocky Branch. Plantings and vegetation were selected to maximize pollutant uptake and provide increased water-quality benefits.

Over the course of the project, there were some periods of dry weather. During those times there could have been issues

with dust control, but water trucks were used to wet the site and keep dust at a minimum. Street sweeping also was performed during the dry periods to clear the roads of sediment and debris, and reduce the impacts of construction on neighboring homeowners.

After construction, and as a result of increasing the park's stormwater-detention capabilities, flow rates leaving the park were reduced by approximately 16 percent during small storm events (happening at least every two years) and medium storm events (generally occurring every two to 10 years). This has a direct impact on the amount of flooding that residents and business owners experience in the Five Points area directly downstream from the park.

#### FROM DETRACTION TO AWARD-WINNING DESTINATION

This project was a collaborative effort among Woolpert water-resource engineers and landscape architects, Columbia Engineering and Parks and Recreation Department staff members, and the community in order to address routine flooding and water-quality issues, while improving the appearance and functionality of this valued downtown park.

"Extreme weather events are part and parcel with living in the Southeast and mitigating stormwater from them in an environmentally responsible way is what this project is all about," says Clint Shealy, Assistant City Manager for Columbia Water. "As this project shows, building more resilient infrastructure can go hand-in-hand with creating a more aesthetic and livable city."

The boardwalk, in particular, which replaced a large, rod-iron fence, turned an otherwise unusable space into an ideal spot for observing birds and wildlife. It also allowed for a more accessible park, enabling people in wheelchairs or those with strollers to reap the benefits of a steady path. Stable walkways, such as this one, are essential to avoid potential erosion of landscape and to control shifting soil. The boardwalk maximizes visitors' enjoyment in the park and helps them connect with the natural beauty of the Rocky Branch stream. As a result, the community can enjoy the serenity of the stream in the heart of downtown Columbia.

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THE BOARDWALK TURNED AN OTHERWISE UNUSABLE SPACE INTO AN IDEAL SPOT FOR OBSERVING BIRDS AND WILDLIFE.

In June, the park also earned the 2019 South Carolina American Public Works Association Project of the Year Award in the category of Structures/Historical Restoration.

"It was important that the design strike a balance between alleviating flooding and creating an engaging destination for the community," Woolpert Program Director Hal Clarkson says. "We went from a park with no detention capabilities to one that's extremely usable and has quantity and quality benefits. I'm proud to be a part of it." **PRB** 

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