Project Converts Land for Redevelopment

Retention basin ponds are replaced with underground vaults.

By John Messerian

Retrofit of Pond No. 3 with a hydrodynamic separation device (on truck) and control structures to improve water quality from US 441 to the proposed chambers.

For years, the Dutch in the Netherlands have reclaimed land from the sea. Now, the city of West Park in South Florida is literally turning water into land, which it hopes to utilize as city-owned sites for redevelopment along the State Road 7/US 441 corridor.

In a partnership among the Florida Department of Transportation (FDOT), the South Florida Water Management District (SFWMD), the Florida Department of Environmental Protection (FDEP), and West Park, three existing FDOT retention basin ponds are proposed to be replaced with an equal-volume underground chamber detention system, freeing up nearly 4.5 acres for redevelopment. Coordinating the effort is Calvin, Giordano & Associates (CGA, www.calvin-giordano.com), a private contract services provider working under a multi-purpose municipal management contract with West Park. West Park, a 2.2-sq mile community of 13,600 residents located south of Pembroke Road and east of 441, became Broward County's 31st city in March 2005. The program calls for the reclaimed land to be deeded from FDOT to the city for redevelopment.

CGA completed a Stormwater Master Drainage Plan for West Park in an effort to improve the functionality of the existing drainage system, and to provide a plan to mitigate flooding of residences and businesses. The report addressed the current drainage system and flooding from storm events within the city limits. The FDOT concurrently made drainage improvements for the SR7/US 441 project, including several large retention ponds for water quality treatment and attenuation. The design includes detaining the stormwater in the ponds, with controlled overflow to the C-9 canal and the Snake Warrior Island Lake, a conservation area, adjacent to the city.

Based on CGA's design, West Park, SFWMD, and FDEP provided FDOT with an alternate drainage solution, which will replace the existing ponds with underground storage chambers and hydrodynamic separation devices to meet stormwater requirements. This project is also in alignment with South Florida Water Management District's ten-year strategic plan: "This project is a partnership with the City of West Park that will support the goals of the Coastal Watershed and the Operation and Maintenance programs and District's Mission by assisting the City in identifying the needs for enhancing and improving the water management of a coastal ecosystem, improving stormwater water quality that is discharged to tide in South Broward, and providing flood protection."

The project also implements goals set forth by the Broward County Watershed Plan, initiated by the county and the State Department of Community Affairs which examines the impact of different land use patterns on the water quality of Snake Warrior Island and the Biscayne Bay. The County and SFWMD Watershed Plan also complement water management activities by developing a set of best management practices for all sources of water runoff into Snake Warrior Island Lake and adjacent communities. In addition, this project complements the city's efforts to update its current comprehensive plan and stormwater master plan (Giordano, 2008) that includes the adoption of low impact design features to the greatest applicable extent when re-building or new building occurs in both residential

Completed Pond No. 5 Phase I with two hydrodynamic separation devices and two control structures located at Hallandale Beach Boulevard and US 441.

and commercial zoned areas in the city.

Objectives

The project's main objective is to reduce pollutant loadings to Biscayne Bay, which is on Florida's List of impaired waters. However, the project will also be a source of future revenues and new jobs, as well as an innovative contender for the LEED Platinum standard status.

The project is anticipated to reduce estimated pollutant loadings by 90 percent. West Park will use a below grade chamber system consisting of either concrete, corrugated metal, or thermoplastic chambers to reduce pollutant loadings to the ultimate discharge points. Currently, runoff from the city discharges to Snake Warrior Island and then makes its way to Biscayne Bay. One of the pollutants of concern for this water body is fecal coliform, which this project also addresses.

Replacing the current West Park ponds with advanced water quality technology and equal-volume underground storage and drainage will provide an alternate use of the land. In lieu of landscaping, irrigation, and maintenance of the existing ponds, the property will become productive along the busy Transit Route known as the "back bone" of Broward County. The replacement of the ponds with a storage chamber will allow the construction of supportive parking for future commercial development. The result will be a future revenue source for the city, as well as the production of jobs within the community. FDOT is making this possible by entering into an agreement that provides deeding the three ponds adjacent to the busy highway to the city for a nominal cost.

In addition to improving the quality of stormwater and the local economy, CGA included an innovative design for this type of facility by initiating a LEED certified facility. The engineers will accomplish the LEED Platinum standard by modifying the installation to collect and filter the collected stormwater with the intent of using it to augment the supply of fresh water. Excess stormwater will then recharge the groundwater supply through exfiltration from the underground chambers.

The design basis for this project uses the Best Available Technology (BAT) and Best Management Practices (BMP). There are no great technical challenges for the proposed project, which makes it readily accepted by a multitude of stakeholders. It will use innovative, yet well understood, processes and construction methods. The city has actively involved other governmental agencies and adjacent communities in the development of its environmental programs.

The public education component includes coverage of the project in the widely circulated local newspapers, as well as on the city's website and in the newsletter. The city will erect educational signage at the site, describing the benefits of this project to the local environment and the economy. Press releases will be distributed during construction and upon each phased completion. Project meetings will be held with residents to promote the resource values associated with this project.

The total cost of this project is $1.9 million. Ad-valorem funds from the SFWMD Broward Service Center were granted for $150,000 for the Stormwater Master Drainage Plan, and $250,000 for Phase I construction. An additional $250,000 was granted by FDEP to complete the Phase I construction, which is complete and functional. Currently, the city has addressed the water quality issues that consisted of the installation of the hydrodynamic separation devices. The second phase will consist of construction of the chambers, and is scheduled to be completed once adequate funding from both the private and public sources is in place. This project is an excellent example of how diverse agencies, such as FDOT, FDEP, and SFWMD can simultaneously contribute to benefit a community's level of service as well as the economy and the environment.

Mr. Messerian is Director of Municipal Engineering, Calvin, Giordano & Associates (www.calvin-giordano.com).

GE

Positioning a hydrodynamic separation device on the east side of US 441, which will be followed by the installation of chambers in Pond No. 4.