

Scheduled to complete in 2021, WSP USA and Ecology & Environment provided the geotechnical and environmental services for the new Shirley Chisholm State Park located in New York City.

PHOTO: COURTESY OF WSP USA

Opinions expressed are those of the advertisers.



Geotechnical Engineering & Environmental Construction Today

Polluted to Blooming

Abandoned urban land is finding new life as green spaces

By Dan Naumovich

WHAT'S INSIDE

- ◆ Parks Replace Blight in Detroit and New York
- ◆ MSE Walls Separate Wildlife from Traffic

In Detroit and New York, Parks are Popping Up on Once-Blighted Sites

In urban areas, parks and recreational spaces are now sprouting up on former industrial sites and dumping grounds—once the geotechnical and environmental scientists and engineers give the all-clear to build.

Since 2004, NTH Consultants has been working with the City of Detroit and the Detroit Riverfront Conservancy in the development of 5.5 miles of property along the Detroit River, most of which was industrial at one point in the city's history. "We did all the geotechnical work on the east riverfront walk, and now we are working on some projects on the west riverfront, including a big park expansion," says Keith Swaffar, executive chairman of NTH.

The challenges with this site have evolved over the years. "In the beginning, the problem was low water. You had to dredge, which can remove support from existing seawall systems and potentially destabilize them. Now we have an alternate issue with high water, which presents its own challenges with flooding and washing out earthen materials behind some of these seawall systems," explains Charles Roarty, senior vice president of NTH.

The entire shoreline is comprised of various levels of fill that was placed upon old marsh land and slopes. The fill includes whatever seemed to be available at the time. Industrial wastes that were discharged onsite contribute to the challenge of establishing a safe foundation for the public facilities.

"We do a lot more in situ testing to evaluate shear strengths," Swaffar says. "We have found that once you get through the fills, the native soils are very sensitive, and you can be overly conservative if you try to extract samples to take back to the lab."

In Brooklyn, 30 years of dumping turned a ground-level landfill on the shore of Jamaica Bay into a toxic heap of waste that blocked both access to and views of the bay. The landfills were capped in the early 2000s, and a recent project has transformed the area into a scenic vista with recreational trails, waterfront facilities, native plantings and more than 35,000 trees—all constructed upon more than 1.2 million cu yd of clean soil.

The new Shirley Chisholm State Park is scheduled to be completed in 2021 by the New York State Parks,

Recreations & Historical Preservation. WSP USA and Ecology & Environment (E&E), now a member of WSP, provided site investigation, environmental permitting and site design services for the project.

Because landfill material is compressible, using conventional fills would have resulted in large settlement. So the geotechnical design specified more sophisticated materials, including geofoam and foam glass aggregate. "These two materials have unit weights substantially less than even conventional lightweight fills," says Brendan Busi, geotechnical engineer with WSP.

The existing landfill membrane contained various geotextiles and drainage layers with low interface frictions. To address potential slope stability issues, careful consideration was given to the limits of the lightweight embankments. The characteristics of the specialized fill materials also impacted design decisions.

"A petroleum-resistant geotextile was used to cover the geofoam to protect it from chemical degradation. A geocomposite drain was also included to help remove forces from seeping soils negatively impacting slope stability, prevent ponding of heavy water in the center of our embankments, and prevent any buoyancy issues that may arise from using such cutting-edge materials," says Peter Koncelik, a senior supervising engineer with WSP USA.

The ultimate goal was to create a natural space for the community. "Prior to the park's construction, this area was one of the most underserved neighborhoods of New York City," says Bob Meyers, E&E project manager. "This project gives the public improved access to Jamaica Bay and enhanced facilities for hiking, biking, fishing, kayaking, photography, picnicking and wildlife viewing. Every time we are onsite, it is a pleasure to see park patrons enjoying unique beauty and natural resources." ♦



On the Detroit Riverwalk, NTH Consultants provided wharf design services for the Detroit/Wayne County Port Authority.