Post-Sandy: Leaders look to engineers for design answers

February 12, 2013 - Design / Build

Consulting engineers are designers of the built environmentâ€” infrastructure, buildings and systemsâ€”that are the measure of our quality of life. With the increasing occurrence of extreme weather-related events, the engineer's role is in the spotlight as never before.

When it comes to rebuilding efforts in the New York metropolitan area post-Sandy, engineers are being sought not only to design innovative approaches to the impacts from rising water levels, but to apply the smartest technologies in the most economical way. "Their skills as designers are being called on to figure out how to reconstruct roadways and floor plans to enhance resiliency, mitigate flooding and keep systems running," said Jay Simson, president of the American Council of Engineering Companies of New York (ACEC N.Y.).

Engineers of all disciplines - structural, geotechnical, mechanical, civil - are being asked for solutions. "Although National Engineer's Week is celebrated every year, 2013 is especially exciting since engineers have been in the spotlight as problem solvers," said Simson, who notes National Engineers Week falls Feb. 17-23. "As the New York area rebuilds after Sandy, prevention is a necessary component, one that engineers are uniquely suited to deal with."

Creative Design Solutions

When Hoboken, N.J. was crippled by Sandy and the PATH trains out of commission for almost two months, a critical transportation artery between Manhattan was lost and much of the mile-square-city was evacuated due to flooding. Knowing for certain they couldn't afford to go through that again, state and local officials have been looking for a way to prevent flooding before another devastating storm hits.

Geotech engineering firm Mueser Rutledge, in conjunction with RSA Protective Technologies, has been in talks with Hoboken and N.Y. leaders about a removable flood wall system that could sustain a hurricane force. The proprietary technology is patent-pending and is currently being prepared for testing at the wave pool at Stevens Institute of Technology Davidson Laboratory/Center for Maritime System, led by professor Alan Blumberg.

The removable walls would surround the perimeter of Hoboken - including the train and ferry stations - and prevent flooding. How it would work, according to Roderic Ellman, a partner at Mueser Rutledge, is a foundation would be in place and the removable walls erected when a severe storm was reported. The foundation is permanent, but everything else is removable and kept in storage. The beauty is that there is little to no environmental impact, it doesn't prevent access to the waterfront or obstruct the view, and it's the least costly solution," said Ellman, whose firm was contacted by RSA to develop the foundation. RSA, which specializes in perimeter security foundation, designed the removable walls.

Aside from Hoboken, RSA president and inventor Rick Adler said they are in talks with FEMA, U.S. senators, N.Y./N.J. state and local officials, and key stakeholders such as utilities and transportation

providers.

The RBA Group is working to mitigate flooding for the N.Y.C. Dept. of Design & Construction in a hard-hit residential neighborhood in Broad Channel, Queens. This is another example of creative engineering, where RBA's engineers have documented the historical rise in sea-level and the extent of flooding along the streets of Broad Channel during storm events. West 11th, 12th and 13th Rds. are narrow residential roadways with single story homes which experience coastal flooding monthly and extreme flooding even during the most modest storm events. Following a study of historical flood data, existing grades, climate change models and soil types, The RBA Group prepared a feasibility study and recommended solutions. The proposed design incorporates new waterfront bulkheads, subsurface retaining walls and newly constructed roadways that are raised by as much as three feet. The proposed improvements will mitigate coastal flooding and will significantly improve quality of life for this community which is rebuilding following Storm Sandy.