Dams/Dykes

Western Branch Dam Downstream Berm

UNITED STATES

Suffolk, VA

Owner
City of Norfolk, Department of Utilities

Engineer
GEI Consultants, Inc.

General contractor
ASI Constructors, Inc.

Dates of work
2016/10 2016/11

Main figures

Vibrocompaction
254 Point(s)

Description

As part of a multi-year initiative to upgrade the seismic and overall stability of a dam located at the Western Branch Reservoir in Suffolk, Virginia, the underwater fill placed for a new downstream berm needed to be densified in order to mitigate liquefaction. The owner initially wanted the general contractor to build a cofferdam, dewater the site, and then place compacted fill in the dry. Together with our client, US Wick Drain value engineered a Vibrocompaction solution that would densify fill placed in the water and mitigate liquefaction while avoiding the schedule, construction and safety concerns associated with dewatering. This approach resulted in substantial cost savings and risk mitigation for the client.

Ground conditions

Clean sand fill to depths up to 16 feet.

Solution

Vibrocompaction is a ground improvement technique that involves penetration of loose foundation soils utilizing an electrically powered Vibro probe. The soil densification that occurs, improves bearing capacity and reduces potential for liquefaction and excessive settlements.

US Wick Drain's innovative proposal of Vibrocompaction was a good fit for this project because it eliminated the need for dewatering. The probe was able to penetrate the placed fill down to the depth of the existing downstream mudline without the removal of water.

There were a total of 254 compaction points advanced to maximum depths of 16 feet.