Diaphragm Wall at the Canton Dam Auxiliary Spillway

Abstract: When it became necessary to increase the storage capacity of Lake Canton, a major water supply reservoir 100 miles northwest of Oklahoma City, the United States Army Corps of Engineers (USACE) decided to construct an emergency spillway to prevent Canton Dam from overtopping. The spillway channel is 450 feet wide with walls totaling 1,470 feet in length retaining up to 50 feet of soil and rock in the dam abutments. The training walls of the spillway consist of 2-foot-wide concrete diaphragm walls with up to two rows of prestressed strand anchors. The spillway features fuse gates designed to pass the probable maximum flood (PMF). The site itself was geotechnically challenging, with relatively weak and erodible rock and soil.

The application of diaphragm wall construction for permanent training walls of the spillway channel provided unique challenges, including the design of tiebacks for extreme flood water levels behind the wall. This presentation will discuss a case study of the design and construction of the training walls and cutoff wall for the Canton Dam Auxiliary Spillway. A combination of methods was used for design, including soil-structure interaction software (WALLAP), slope stability and seepage analysis software (SLOPE/W and SEEP/W) and conventional techniques. Construction photos will be included.

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Ms. Nodine earned a M.S. degree from the University of Texas at Austin in 2007 and is a P.E. registered in Colorado. She has worked at GEI Consultants since 2008 as a design geotechnical engineer on projects involving dams, water supply reservoirs, landslides and earth support. Before working at GEI she was a staff engineer at Grubbs, Hoskyn, Barton and Wyatt, Inc. in Little Rock, Arkansas where she worked on a variety of foundation and earth retaining structure designs.