

A Salute to One of Our American Heroes

A Schnabel dam engineer recently returned from deployment to Iraq. As a member of the North Carolina National Guard, Rob Indri was deployed with the 1/252 Combined Arms Battalion of the 30th Separate Heavy Brigade Combat Team (HBCT). As an infantry fire team leader for Bravo Company, Rob spent several months training prior to going overseas. After training at two Army bases, he landed in Baghdad.

The year passed and thankfully, Rob has returned safely to us. While assigned long hours and dangerous assignments, Rob frequently chimed in by email on project issues and design code interpretations, and to check up on everyone back home.

Rob's wife, Jody, and their two boys, Hunter and Giovanni, moved during his deployment to be closer to family. When word got out of Rob's deployment, an outpouring of donated vacation time came in from throughout Schnabel to supplement military pay during his absence. More than 600 hours pay was raised for Rob and his family, plus a corporate bonus to recognize his service both to the firm and to our nation.

We are excited to have Rob, Jody, and the boys back, and we are all thankful for Rob's service to our country. A-ten-hut [sharp salute]!

Rehabilitation of Historic New Jersey Dam Wins Awards (and it looks great!)

The Eastern Pennsylvania-Delaware Chapter of the American Concrete Institute (ACI) recently honored Schnabel Engineering and its Sally's Pond Dam Rehabilitation Project (owned by NJDEP – Parks and Forestry) with its Grand Prize Award in the Civil/Site Construction Category for excellence in concrete design and construction. It looks great, doesn't it?



■ If you prefer to receive Water Wire electronically or wish to unsubscribe, simply email dams@schnabel-eng.com

Welcome to Water Wire

This quarterly newsletter is being sent to clients and friends of Schnabel Engineering. It will feature news on pertinent issues, projects and people, and will have a strong focus on your interests and concerns. We are thankful to have so many loyal friends in the dam engineering community. One way for us to say thank you is to share updates that are informative, entertaining, and of value to you.



From the Director's Chair
**Thanks for 15 Years of
Dam Engineering!**

Dave Campbell has been instrumental in making dam engineering one of Schnabel's marquee service areas.

Gordon Matheson, CEO, Schnabel Engineering

After 15 years, we think it's time to celebrate! Rolling out Water Wire is one way to include our friends in the celebration. Another is the recent incorporation of Schnabel Dam Engineering as a member of the Schnabel Engineering family of firms. We've refocused to more effectively mobilize our dam engineering people to enhance our mission critical focus on being there - ready to serve you whenever future needs arise. We will continue our commitment to earning your trust and your respect.

At first blush, our initial 15 years seems dominated by some of our bigger and more notable projects, such as the 185-ft high Hickory Log Creek Dam in the Atlanta Metropolitan area; the Lake Townsend Dam replacement in Greensboro, North Carolina (incorporating a new 300-ft wide labyrinth spillway); and the on-going design of the 135-ft high Ragged Mountain Dam for the Charlottesville, Virginia area.

However, I believe that our heritage and our strengths were forged in the crucible of the many smaller projects that confronted us with smaller budgets, but equally challenging problems. These projects established our focus on client service, reinforced our commitment to staying current, and taught us how to mind the bottom line and listen to our clients. These projects created our success. The big, whiz bang projects came to us because of those successes. We cannot afford to forget the important lessons we have learned from our many friends (thank you!), nor the ones we at Schnabel taught each other over the years.

What we have achieved is an expression of individual intellects and individual efforts working in coordinated collaboration towards a common goal of excellence. The Ancient Greeks called it 'arête' ("excellence at all things"). I continue to be amazed at how much more we can be when we effectively pool our insights and intellects for a common purpose.

The past 15 years has passed in the blink of an eye, and yet the mid-1990s seem like a long time ago. Paradoxes like this are part of the rhythm of life. Each of us is limited in what we can personally accomplish. As a team, we can unite to embody a remarkable intellect, highly perceptive insights and perspectives, and a contagious passion and unstoppable can-do attitude. From humble beginnings, a small band of dam engineers pulled together to seize the opportunity provided us by Schnabel, and enthusiastically build a formidable team of specialists with a singular focus on arête.

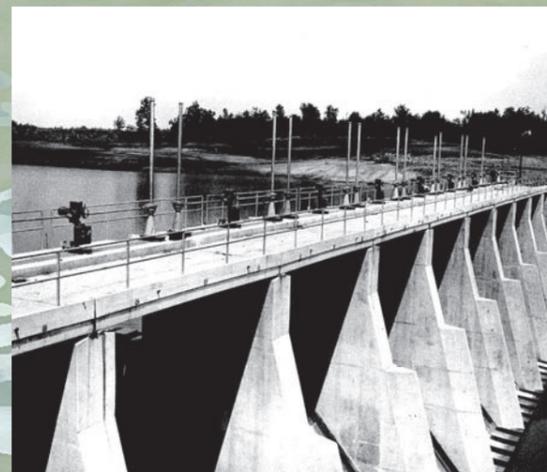
It is time for a few minutes of reflection to sharpen our perspective. Just as seed can't grow without moisture, nutrients and sunshine, our dam engineering practice couldn't have grown without a rich and supportive environment. Enthusiastic encouragement and support throughout the firm broadened our reach, enhanced our market intellect, accented our ability to serve clients, and kept our batteries charged. We have drawn upon and been greatly enriched by our geotechnically-focused associates. Schnabel traditions of stewardship, commitment to technical excellence, and support for entrepreneurial spirit provided us with a fertile environment in which to flourish. Thanks to all of Schnabel for supporting us over the years and measurably participating in our successes.

Equally, we thank the many exceptional clients, regulators, contractors, suppliers and researchers that have collaborated with us towards creation of exceptional solutions, and reinforced the fundamentals of listening, caring, performing, and joining in celebration.

We sharpen our skills; we stay at the ready, and yearn for a mission to prove our mettle. joined by our comrades, our resolve is steady; we commit to our purpose and won't ever settle.

LAKE TOWNSEND DAM PROJECT

Lake Townsend is the primary water supply for the City of Greensboro, North Carolina. Concerns with the integrity and hydraulic capacity of the spillway prompted design of a replacement spillway allowing the City to maintain the reservoir at full pool during construction. The following is a snapshot summarizing the design and on-going construction.



The concrete spillway at Lake Townsend Dam in 1968, shortly after construction was completed.

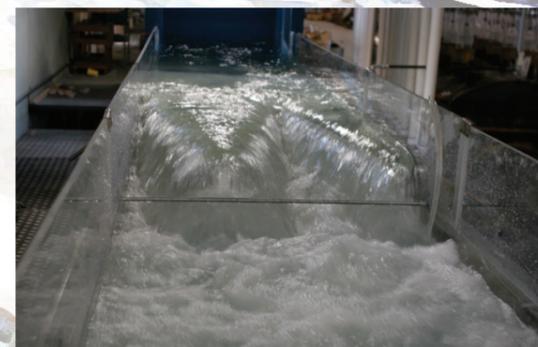


Spillway circa 2005. Deterioration and cracking of the spillway first noted in the early 1980s. Cracking became more significant. The City of Greensboro found the spillway concrete was suffering from Alkali Silica Reactivity (ASR) and that the reaction was on-going. The spillway also had inadequate hydraulic capacity to pass the spillway design flood.

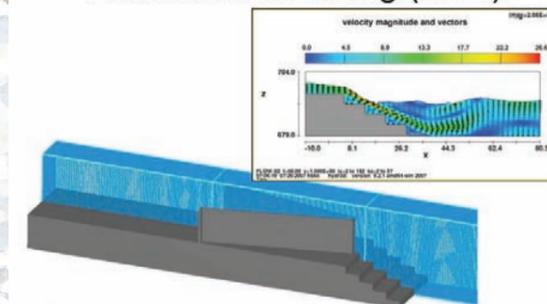


Schnabel evaluated the existing structure and alternatives for rehabilitation or replacement. This included underwater inspections, geophysical surveys, and subsurface explorations, including drilling and sampling in the lake upstream of the spillway.

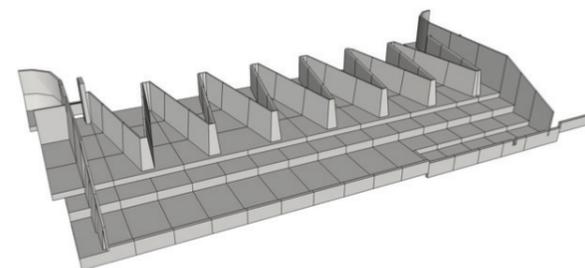
Post-tensioned anchors were installed to improve structural stability during design and construction of the replacement dam.



Numerical Modeling (CFD)



A labyrinth spillway was selected based on hydraulic efficiency and the City's desire to avoid the maintenance, operations, and risks related to gates. Physical and computer modeling of the spillway was performed to validate hydraulic performance. Physical modeling was completed at the Utah Water Research Laboratory at Utah State University. Computational Fluid Dynamics (CFD) modeling was developed at Idaho State University.



The replacement Dam includes a seven cycle labyrinth spillway with a weir height of 20 ft, spillway width of more than 300 ft and a total weir length of nearly 1200 ft. The spillway will be flanked by earth embankments that tie into the existing embankment and abutments.

