

Dallas Floodway Team: Maj. Jeff Braun

For the U.S. Army Corps of Engineers, drawing on West Point talent to strengthen a Dallas levee project is all in a day's work

DALLAS – Soil mechanics is a textbook tool for Maj. Jeff Braun.

For years it helped inform his management of army and police construction projects during multiple deployments to Iraq and Afghanistan as a U.S. Army engineer.



As an instructor at the United States Military Academy, soils are a focal point for a course he teaches to cadets at West Point.

Braun actually teaches two engineering classes to cadets: an introductory course on statics and mechanics of materials and another in soil mechanics. He received a bachelor of science in civil engineering at West Point before going on to earn two master's degrees - one in civil engineering from the University of California-Berkeley and the other in engineering management at Missouri University of Science and Technology. Braun is also a licensed Professional Engineer in the state of California.

This summer he brought these skills to bear in service of the U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC), which assigned him a Dallas levee project to study and critique. On Sept. 22-26, Braun made his second site visit to North Texas to learn even more about the Trinity River floodway through downtown Dallas.

One of Braun's motivations to study this project was to bring to his cadets real-world civil engineering applications of textbook learning while also adding to his own professional development. The partnership program between ERDC and West Point encourages instructors to work on research projects. Such involvement by a Civil Engineering instructor at the United States Military Academy exemplifies the deep bench strength the Corps of Engineers draws upon to serve the nation.

Braun visited ERDC in June to learn the numerical modeling programs the Corps uses for levee systems -- then he did his own independent analysis on a portion of the East Levee, working through the geometry of the levees, the surveys, the borings, and the soils data.

He asked a lot of questions and provided his own point of view. Site visits in June and September told him the rest of the story foretold by engineering documents. They yielded more valuable lessons to share with his students back at the Military Academy.

- Should weathered shale be modeled as competent rock or more as a soil?

- There is currently lush vegetation on both the land and river sides of the levee, even amid a drought. Those are visual clues to soil saturation and potential wicking action -- important in assessing how barrier conditions will perform during flood events.
- Drought conditions can also generate visible desiccation cracks along the levee crests and embankment. If filled with debris such as gravel, the cracks may no longer close up or heal completely when they are saturated – and may become an erosive channel for water that further weakens the top few feet of a levee.

Back in the West Point classroom these issues will come alive this spring for Braun's soil mechanics cadets. There's also potential for sending some of these cadets to the Dallas Floodway for a couple weeks this summer to heighten their own classroom experience – and continue building the Corps of Engineers bench strength for another generation.

For the Corps, the West Point instructor has become an invaluable sounding board. Now four months into his involvement, Braun believes his input provided an arms-length assessment of the Floodway projects and helped the Corps of Engineers staff avoid the dangers of groupthink.

“I might be an Army Officer for the Corps of Engineers, and I happen to be working with the Fort Worth District, but I don't work directly for the district,” Braun said.

For the Corps of Engineers, public safety is paramount. Utilizing West Point civil engineering expertise is one example of how the Corps of Engineers taps experts in the field to reduce the risk of catastrophic levee failure and fulfill our mission of enhancing public safety.

- *Jim Frisinger, Fort Worth District public affairs specialist, Oct. 26, 2011*