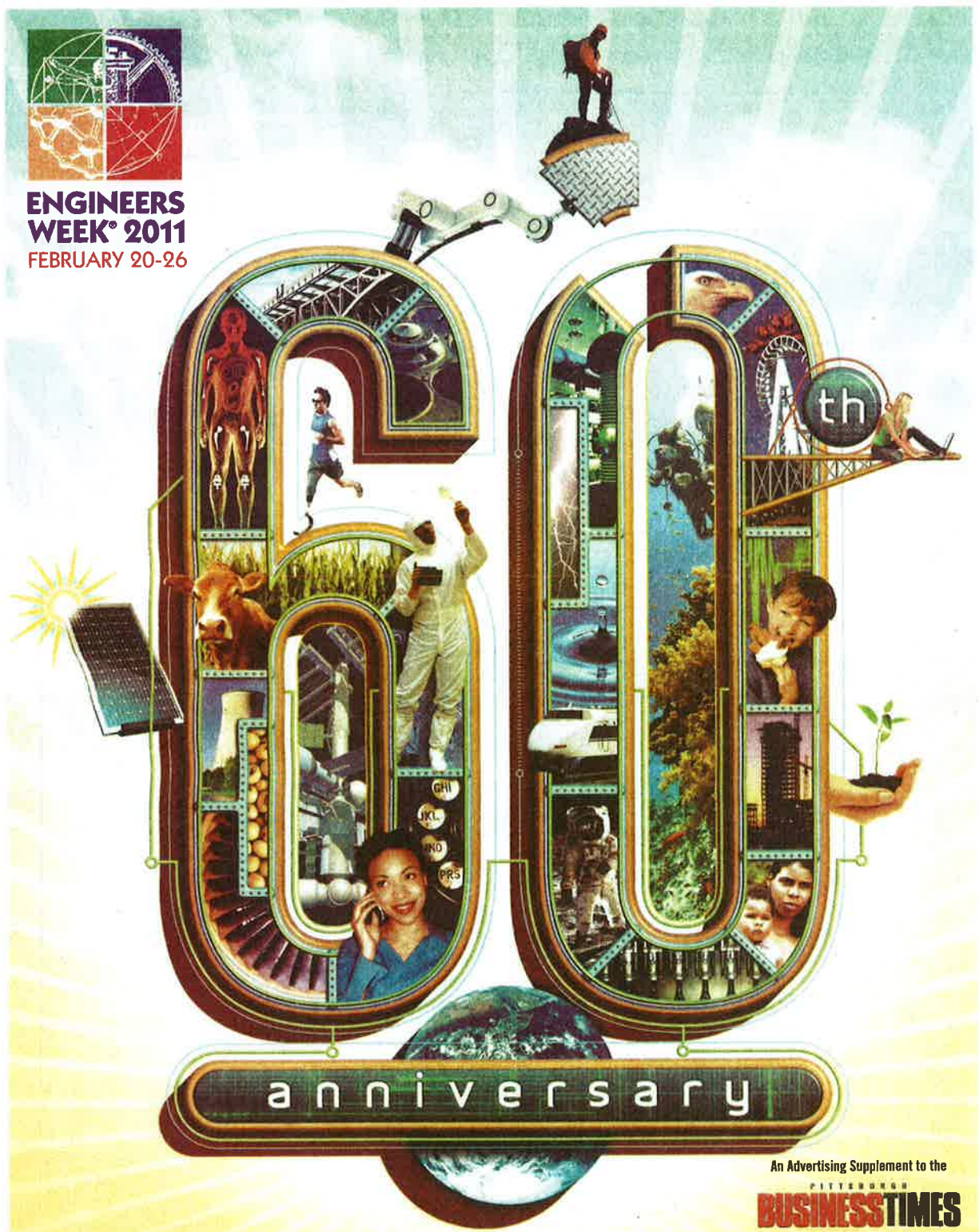




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Engineers: Turning Ideas into Reality

## ESWP Civil Project of the Year Taum Sauk Upper Reservoir Dam Restoration Project



The Taum Sauk Upper Reservoir Dam is located on the east fork of the Black River in Missouri. The project was named the ESWP 2010 Civil Project of the Year.

Paul C. Rizzo Associates, Inc. (RIZZO), a global engineering and consulting firm headquartered in Pittsburgh, is the recipient of the 2010 ESWP Project of the Year Award for the Taum Sauk Upper Reservoir Rebuild. RIZZO served as the engineer of record and construction manager for the \$495 million project.

The rebuild of the Taum Sauk Upper Reservoir Dam resulted in the largest Roller Compacted Concrete (RCC) dam

in the Western Hemisphere. The hydroelectric plant is owned and operated by AmerenUE, Missouri's largest electrical utility company.

Located in Reynolds County, Missouri, on the east fork of the Black River, the facilities at the plant consist of a ridge-top upper reservoir, a shaft and tunnel conduit, the powerhouse and a lower reservoir. The original upper reservoir structure, designed and constructed in the early 1960s, was a rockfill, kidney-shaped dam with a reinforced concrete face; the upper reservoir had no spillway and no drainage area. A geomembrane liner was added to the interior face in 2004 to decrease existing downstream leakage.

On Dec. 14, 2005, a 700 foot section of the dam surrounding the upper reservoir failed and released 1.4 billion gallons of water down Profit Mountain into the Black River and Johnson's Shut-ins State Park. After this catastrophic event the Federal Energy Regulatory Commission (FERC) required the owner, AmerenUE,

to conduct a thorough investigation to determine the cause of the failure.

AmerenUE contracted RIZZO to perform a root cause analysis, then to ensure the immediate safety of the remaining sections of the dam and create a conceptual design of the rebuild. RIZZO's evaluation revealed the dam breach was directly caused by substandard construction design and practices (according to today's regulations), and faulty instrument control systems which allowed for overtopping of the dam and thus eventual erosion of downstream slopes. Based on numerous tests and the construction quality of the remaining structure, it was concluded a partial rebuild would not be a technically feasible solution.

Pursuant to FERC regulations, AmerenUE embarked on a complete restoration of the Upper Reservoir as a RCC Structure. Together, owner AmerenUE, engineer of record Paul C. Rizzo Associates, Inc., and contractor Ozark Constructors - A Fred Weber and ASI Joint Venture, worked to overcome challenges

and restore a major source of energy to Missouri.

The new upper reservoir, completed in late 2009, involved a complete rebuild of the dam consisting of approximately 2.8 million cubic yards of RCC and 300,000 cubic yards of conventional concrete. The reservoir rebuild resulted in many innovative solutions such as the on-site crushing and processing of the original dam rockfill which was used in the production of RCC.

The upper reservoir underwent a refill testing program, and is back on line and generating power. It is the first pumped storage project in the world to utilize an RCC water retaining structure. The project has been featured in numerous international publications, and in addition to the ESWP Award has been granted the 2010 Award of Excellence in Constructed Project from the United States Society on Dams and is a finalist for the upcoming 2011 Outstanding Civil Engineering Achievement Award from the American Society of Civil Engineers.

## Shepherd's Heart Building Hope: Local AEC Community To Build Kitchen To Benefit Area Veterans

On any given day, there are over 250 homeless veterans on the street in Western PA. Increasing in numbers are the young soldiers returning from the current theatre with various issues including post traumatic stress disorder. The Society for Marketing Professional Services (SMPS) Pittsburgh Chapter along with friends of the local architectural, engineering, and construction (AEC) community are lending their hearts and hands to renovate a kitchen for the Shepherd's Heart Veteran's Home.

Located one block from Mercy Hospital in Oakland, Shepherd's Heart Veteran's Home is a partnership between the Pittsburgh VA's Healthcare System and Shepherd's Heart Fellowship, a parish of the Episcopal Diocese of Pittsburgh. Shepherd's Heart provides outreach to veterans living on the streets, meals for the homeless and poor, and shel-

tered transitional housing. Reverend Mike Wurschmidt, or Father Mike, is the founder of Shepherd's Heart and oversees their programs. Each day Father Mike opens his doors to help Pittsburgh's homeless and needy by providing meals, a drop in center with showers and laundry, case management and rehabilitation services, employment and life skills training, and transitional housing.

Shepherd's Heart is in need of a modernized, industrial kitchen that will enable them to continue their programs. Currently, meals are prepared using a small, under-equipped, aging kitchen. The kitchen lacks proper refrigeration and dry storage space to effectively store the large amounts of donated goods that Shepherd's Heart receives on a regular basis. Food is often discarded after it spoils due to a lack of

proper storage space.

SMPS chose "Shepherd's Heart: Building Hope" as part of its community outreach to answer a very important need. Furthermore, the board felt it had the resources and connections to the industry professionals who could tackle this project and help our local veterans and homeless. The goal of this SMPS project is to provide the funding, design, and construction that will result in a functional kitchen capable of providing daily meals to Pittsburgh's homeless veterans.

"The commercial kitchen will enable us to provide better quality meals to the homeless and veteran populations we serve. We see Pittsburgh's homeless every morning at Shepherd's Heart, in addition to the needs of the 15-bed veteran transitional housing unit and the homeless veterans who sleep in

our basement each night," offers Father Mike. "The kitchen is a mainstay in what we do for the homeless, and these improvements offer incredible opportunities for our functional needs and the services we provide."

The kitchen renovation project involves completely redesigning the layout of the existing kitchen and incorporates modernized, industrial equipment necessary to run the kitchen efficiently. The proposed renovations will support Shepherd's Heart's needs and will allocate the space required for proper food storage and commercial refrigeration units. The SMPS design team is completing the design and preparing preliminary cost estimates that will help the team solicit funding and sponsorship. Construction of the new space is estimated to begin this summer.

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