Copperhill Watershed Restoration, completed for Glenn Springs Holdings, Inc., in Ducktown, Tennessee, by Nashville engineering firm Barge Design Solutions, won the top Grand Iris Award in the 2019 Engineering Excellence Awards competition, presented by the American Council of Engineering Companies of Tennessee.

The Copper Basin, located in the southeastern corner of Tennessee, is the site of a massive sulfide deposit. Mining began in 1850 and continued until 1987. During its operation, the Copper Basin produced 90,000,000 tons of ore. During early space flights, NASA astronauts commented that the 2 man-made features visible from space were the Great Wall of China and the Copper Basin.

In 2001, under the direction of EPA Region IV, the Copper Basin site was created as a Superfund Alternative Site, with Glenn Springs Holdings, Inc. entering into orders with the EPA and TDEC for reclamation. The site includes the North Potato Creek Watershed, the Davis Mill Creek Watershed, and portions of the Ocoee River Watershed from the Copper Basin Reach to Parksville Lake.

Due to the size and complexity of environmental issues, the site is considered an EPA Mining Megasite and is the largest reclamation site in the eastern United States. Barge Design Solutions served as the prime consultant from 2001 through completion of final reports, as-builts and operations and maintenance plans in 2019.

The dramatic transformation of the Copper Basin in Southeast Tennessee has been the successful result of many restoration tasks to repair the damage caused by decades of mining and acid production. For the restoration of North Potato Creek, remedial goals included removal of human health risks and restoration of natural, healthy communities of aquatic insects.

Efforts included identifying types of potential contaminants and possible physical hazards, such as ait shafts, drifts and abandoned mines from the 1800’s.

The project team included civil, environmental, and mechanical engineers, surveyors, geologists, geochemists, biologists, and risk assessors.

PCB and asbestos assessments, lead sampling in surface and sub-surface soils, stormwater monitoring events, surface water, sediment and aquatic macroinvertebrate assessments, and bathymetric studies of mine pits were all completed.

Remedial actions included engineering evaluation/cost analyses to design acid-mine drainage water treatment plant to treat all storm flow up to a 10-year/24-hour storm event in the North Potato Creek Watershed, upgrade of the Cantrell Flats Water Treatment Plant in Davis Mill Creek, design of the Belltown Diversion in Davis Mill Creek, design of passive treatment wetlands, reconstruction of the Burra Burra Creek, design of RCRA-compliant multi-layered caps, design of subaqueous waste material disposal, and removal of asbestos PCBs and lead contaminants.

The novel approach of adaptive management allowed the project to move efficiently through assessment and remediation in less than 20 years. This innovative approach brought environmental, social, and economic benefits to the community through the transformation of damaged watersheds into healthy streams and rivers that serve residents and visitors with many recreational opportunities, as well as educational opportunities through events and displays showcasing the history of the site and its evolution.
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Grand Award Winners

Barge Design Solutions, Grand Iris Award for Copperhill Watershed Restoration: (l-r) Carrie Stokes, PE, Barge Design Solutions; Tom McComb, Barge Design Solutions; and Rick Passmore, Glenn Springs Holdings.

Volkert, Inc. for Connect Columbia Comprehensive Plan: (l-r) Dyan Dameron PE, PTP, Volkert; Michah Wood, AICP, Volkert; Paul Keltner, City of Columbia; Brooke Young, Volkert; Glenn Harper, PE, City of Columbia; Brad Thompson, AICP, ENV SP, Volkert; and Lina Khourey, PE, CPESC, Volkert.

Terracon Consultants for Lipscomb University George Shinn Event Center: (l-r) Chris Green, Laura McDonald, John Agee, PE, Patrick O’Leary, Laura Reinbold, PE, and Alex Goharioon, all with Terracon.

Alfred Benesch & Company, People's Choice Award for I-240 CMGC MemFix4: (l-r) - Brandon Akin, TDOT; Brian Gaffney, Alfred Benesch; Chris Kelley, Alfred Benesch; David Paris, Kiewit; Nitaya Changkura, PE, Alfred Benesch; Brian Ralstin, PE, Alfred Benesch; Shane Smith, Kiewit; Will Reid, PE, TDOT; Jay Armstrong, TDOT; Michael Sheston, Kiewit; Sammie McCoy, PE, Alfred Benesch; Robert Bagwell, Alfred Benesch; Jake Williams, PE, Alfred Benesch; and Chris Frieberg, Kiewit.

Allen & Hoshall for Methodist University Hospital Expansion Project: (l-r) - Keith Seagraves, PE, Harry Pratt, PE, Lee Palmer, PE, and Mike Sheridan, PE, all with Allen & Hoshall.

FOXPE, LLC for Turtle Park Pump Station Improvements: (l-r) - Patrick Berge, Oak Ridge Utilities Manager; Dudney Fox, PE, Principal, FOXPE; Tom Roberts, Oak Ridge Superintendent; and Ben Vaught, PE, FOXPE.
**GRAND AWARD WINNERS**

OGCB, Inc. for Crosstown Theater - Jim Prillaman, PE, LEED AP.


Kimley-Horn for Hermitage Flats: (l-r) - Philip Neal, PE, Kimley-Horn and Adam Birdwell, PE, Elmington Construction.

CDM Smith, Inc. for M.C. Stiles WWTP PAA Effluent Disinfection: (l-r) - Jeff Mize, PE, CDM Smith; Will Reid, PE, TDOT; Rachel Gentry, PE, TDOT; Joe Deering, PE, TDOT; Brandie Cookston, PE, CDM Smith; and Liza Joffrion, CDM Smith.

Smith Seckman Reid, Inc. for BGMU Alternative Disinfection System: (l-r) - Mike Bernard, PE, SSR, Inc.; Andrew Johnson, PE, SSR, Inc.; Brett Jones, BGMU; Lindsay Bryant, PE, SSR, Inc.; Richard Chappell, PE, SSR, Inc.; Kelsey Vines, SSR, Inc.; and Mike Rogers, SSR, Inc.

Gresham Smith for LG Electronics New Appliance Manufacturing Plant Phase 1: (l-r) - Rodney Chester, PE, Gresham Smith; Dave Verner, RA, Gresham Smith; Sejin Kim, AIA, LEED AP, Gresham Smith; Paul Wallis, PE, Gresham Smith and Carl Munkel, Gresham Smith.

Project team photos not available for the following Grand Award winners:

A2H, Inc. for St. Jude Atrium Sequin Mural Design
Ensafe, Inc. for Ft. Hartford Stone Quarry NPL Site UAS_Lidar & Thermal Survey
I.C. Thomasson Associates, Inc. for Omohundro Campus Substation and Generation Facility
Kimley-Horn for Murfreesboro Pike Transit Signal Priority
Chosen as the People’s Choice by attendees of the 2019 Engineering Excellence Awards, MemFix4, completed by Alfred Benesch & Company, successfully transformed aging infrastructure on the a highly travelled section of I-240 in Memphis.

The Tennessee Department of Transportation sought to complete the widening of the highly traveled I-240 corridor in Memphis, Tennessee, but doing so required addressing the aging bridges and seismic demands of the area. The project, named MemFix4, is comprised of four structures: two Poplar Interchange bridges, a dual-track Norfolk Southern Railroad (NSR) bridge, and the Park Avenue bridge.

Through the CMGC delivery method, with Alfred Benesch & Company serving as the Construction Manager General Contractor, the project successfully constructed the new bridges over a widened I-240 in 18 months utilizing Accelerated Bridge Construction techniques to minimize impacts to traffic and to NSR. The full consultant team included Kiewit Infrastructure South Co. as General Contractor/Construction Management, Barge Design Solutions as structural, survey, and traffic control, Geotechnology as geotechnical, Gresham Smith as ITS and utility coordination, and HDR as independent cost engineer.

MemFix4 is only the second transportation project in the state of Tennessee to use the CMGC method, which maximizes efficiency and enables close collaboration between the project owner, design team and contractor during design and construction, while facilitating effective use of ABC techniques to further expedite construction - quite necessary on a project with traffic levels of approximately 180,000 vehicles and 20 freight trains per day.

Innovative construction methods and materials, including new substructures constructed under traffic and modular bridge superstructures rolled and lifted into place were unique opportunities for innovation. Two-span steel girders replaced four and five-span PPC beams on Poplar Avenue, satisfying seismic codes and increasing long-term reliability. Each bridge replacement occurred over 56-hour closure weekends of I-240, significantly less time than if the bridges had been constructed in place.

Members of the Federal Highway Administration and Departments of Transportation from across the country gathered to watch the rail bridge slide in person. The project was completed on schedule in June, 2019, at a cost of $54,571,000.