



G2 provides mass concrete temperature control for large bridge piers

When Rohrscheib Sons Caissons, Inc. recently needed to install eight large drilled concrete piers for a new railroad bridge over the Illinois River, the firm retained G2 Consulting Group to prepare a plan to keep the concrete within specified temperature ranges as it cured and to monitor the concrete temperature during curing.

The new Canadian National railroad bridge in Grundy County, Ill., is being built in conjunction with alterations to the Elgin Joliet and Eastern Railway line and replaces an existing railroad bridge deemed "obstructive to navigation" by the U.S. Coast Guard under provisions of the Truman-Hobbs Act.

With a relatively large diameter of 10 feet 4 inches, the drilled piers are subject to temperature control specifications for mass concrete. To prepare a mass concrete temperature control plan submittal, G2 evaluated a variety of concrete mix designs using Concrete Works Version 2.1.2. It predicts the concrete's

maximum internal temperature and maximum edge temperature providing the concrete's differential temperature during the drilled piers curing. The software uses the mix design, initial concrete temperature, pier dimensions and expected subsurface materials to predict the maximum temperatures. Since piers on the bridge's south side are located in the river, G2's analysis also included scenarios based on expected river temperatures.

Based on our evaluation and the expected concrete mix design, G2 determined that the concrete temperature would remain below the specified maximum internal concrete temperature of 160° F provided the concrete was placed at a temperature at or below 71°F, and that the maximum differential temperatures between the center and outer portions of the drilled piers would remain below recommended values. For the piers located in the river, our analysis indicated that the concrete would

have a maximum temperature below the specified 160° F; however, the differential temperature between the center and outer pier would exceed



G2 The Geo-logical Choice

We're proud to announce the following new clients and projects!

Client: *Cunningham-Limp Company*
Project: Detroit Country Day Fieldhouse, Beverly Hills, MI – geotechnical and construction engineering

Client: *Posen Construction Company*
Project: Wadhams Road bridge, St. Clair County, MI – geotechnical and construction engineering

Client: *McCarthy Smith Construction Company*
Project: Wayne – Westland Schools, Wayne/Westland, MI – geotechnical and construction engineering

Client: *State of Missouri/Motorola/Pyramid Construction*
Project: State of Missouri Communication System, various Missouri locations – environmental consulting

Client: *Fullerton Engineering*
Project: Alleghany Power Communication System, West Virginia and Maryland – environmental consulting

Client: *Oakland Schools*
Project: Oakland Schools, throughout Oakland County, MI – geotechnical and construction engineering

Client: *George W. Auch Company*
Project: Monroe Mercy Hospital, Monroe, MI – geotechnical and construction engineering

Client: *Penobscot Management*
Project: Existing apartment complexes in Schaumburg and Downers Grove, IL – geotechnical and pavement investigations

Client: *Ehrsemann Engineering*
Project: Proposed communication towers in Iowa – geotechnical services

Client: *Horvath Communications*
Project: Proposed communication tower sites across the Midwest – geotechnical and environmental services

recommended values. In order to control the differential temperatures, G2 recommended insulating upper portions of the piers located in the river water, and also a cooling system for the center of the piers.

G2 installed concrete temperature/maturity loggers manufactured by Engius on the drilled pier reinforcing cages to monitor the concrete temperature at the outer edge and center of the piers during curing. The loggers were set up to take temperature readings every hour and the information was downloaded and data analyzed. G2 was also on site during the concrete placement operations to check fresh concrete temperatures as it was delivered to the site.

A summary letter of the data and our analysis was presented to the client, typically one week after completion of the concrete placement operations and after concrete temperatures began to decrease.

G2 contributes to rehabilitation of I-96 in central Michigan

G2 Consulting Group is providing geotechnical recommendations for design and construction of roadways, bridge widening, ramps, retaining walls, signs and signals related to rehabilitation of seven miles of I-96 and intersecting roads from south of Saginaw Highway to west of Wacousta Road in Lansing.

Construction is underway and expected to last through fall 2011.

D. J. McQuestion & Sons Company of LeRoy, Mich., is the prime contractor for the design/build team, and Alfred Benesch & Company of Lansing, Mich., is the prime engineering firm on the team.



Jeff Warchall joined G2's Chicago office as a staff engineer in the geotechnical group. Jeff earned a bachelor's degree in civil engineering from Northwestern University and previously worked for an engineering consulting firm in Chicago.

Heather Sandor, an environmental scientist in G2's Troy office, recently met the federal definition of an Environmental Professional (EP) by meeting experience, education and certification standards specified by the Environmental Protection Agency. This qualifies Heather to conduct the all appropriate inquiry (AAI) environmental due diligence investigations required to exempt commercial real estate purchasers from cleanup liability for past contamination of a site.



Congratulations to **Tony Poisson** of G2's Chicago office and his wife Brenda, who were married Sept. 18.

