PRICE AND COMPANY, INC.

CASE FILES

Geopro® Learning Tool **Preliminary - April 6, 2002**

1.800.248.8230

Wyoming
425 36th St SW
Wyoming, MI 49548-2108
T: 616.530.8230
F: 616.530.2317

Wixom
46986 Liberty Drive
Wixom, MI 48393-3601
T: 248.668.6000
F: 248.668.9749

geopro@priceandcompany.com
www.priceandcompany.com

Soldier Field

Chicago, IL Winter/Spring 2002

Rehabilitation of **Soldier Field** began, literally, the moment the whistle blew signaling the end of the Bear's 2001-2002 season. Planned demolition removed everything but the outer façade walls and adjoining superstructure. Tight schedules allowed an early March start of interior superstructure foundations.

An integral part of this work included dewatering scores of pile cap excavations, elevator pits and other below-grade structures. Most excavations included the removal of construction rubble, native soils and a layer of black, organic material identified as the residue of Chicago's buildings lost in the great fire of 1896. The mix of ground water, snow melt, periods of rain from an 'open' winter, variable soils and concrete dust from fresh pours made a 'witches brew' for the dewatering contractor, **Griffin Dewatering** of ajs;f, TX.

City of Chicago requirements demanded filtration of this 'brew' through 5 micron filters prior to disposal into the City sanitary system. None of the water could enter the City storm drain system.

To accomplish the task, the site dewatering contractor, **Griffin Dewatering** of adfjas;kfj, Tx, set up seven pumps, each with a 6" discharge hose and an approximate pumping rate of 150 gpm. Depending on site activity, either three or four pumps discharged to an intricate filtration system consisting of multiple settling tanks, each with a nonwoven geotextile filter, and a subsequent filtration mechanism, consisting of multiple cartridge filters of varying opening size, the last of which being 5 microns.

From the beginning, pumping of the highly turbid water clogged both the geotextile and cartridge filters, creating problems for **Griffin Dewatering**, including excessive material and labor costs as well as the inability to maintain 'dry' excavations for the foundation contractor.

Clogged geotextile filter
of initial system

Cage within 12” tee

Floc Log placement within tee cage

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In addition, occasional discharges to the City’s storm drain system resulted from clogged system overflows and back-ups. *Clearly, a system that utilized filtration techniques could not provide the performance needed for this project.*

In search of a solution, **Griffin Dewatering** contacted **Ero-Tex**, Madison, WI [distributor for **Price and Company, Inc**.]. *The resultant trial program included deploying a chemical method, i.e., flocculation using anionic polyacrylamides [PAM’s].* Specifically, site water sampling and simple bench tests indicated that **Applied Polymer Systems, Inc.** [Woodstock, GA] **704b Floc Logs**® [a partially hydrated form of PAM] formed large flocs within seconds after introduction and mixing.

When properly matched to site soil lithologies and water chemistries, one or more polyacrylamides [PAM’s] will cause rapid, relatively complete flocculation and/or chelation of suspended solids within a water column. Once formed, the floc will drop, via gravity, in a quiescent water body, allowing passage of relatively clean surface waters.

To deploy the polymer, **Griffin Dewatering** placed three 12” tees within one of the pump discharge lines, with each tee spaced between 50’ and 100’ apart. One or two **Floc Logs**® were placed in a cage and then inserted into the tee. Mixing of the polymer and water took place within the 450+’ of hose extending from the last tee to the outfall point. Flow volume, length of mix time and polymer efficiency dictated the quantity of **Floc Logs**® needed for this discharge system.

The quiescent water body used for this trial included a foam-sealed, 40 yard roll-off dumpster. Upon entering the dumpster, the majority of floc quickly settled to the bottom, allowing the gravity-decanted, relatively clean water to discharge to the sanitary storm system.

Dependent on pump inlet locations and site water conditions, water entering the polymer based discharge system varied in turbidity between 240 and 1300+ NTU [light diffraction measurement unit], i.e., moderately cloudy to extremely cloudy, respectively. Once discharged into the dumpster, with appropriate settling, the resulting turbidity was reduced to values ranging between 10 and 34 NTU.

34 NTU water decanted from dumpster at terminal end of polymer based discharge system

Advantages of Floc Log® Approach:

1. Develops superior performance,
2. Significantly more economical,
3. Passive system, needing minimal maintenance, and
4. Easily adapted to existing systems and dewatering contractors equipment.

Contractor Actions Based on Trial:

1. Optimize application techniques and water clarification on current polymer based discharge line.
2. Change over remaining six discharge lines to accommodate polymer inclusion,
3. Deactivate and remove existing filtering systems, and
4. Review if and how best to utilize polymer based systems on additional projects.

Please contact **Price and Company, Inc.** to obtain additional information pertaining to **Applied Polymer Systems, Inc.** anionic PAM’s or visit:
www.siltstop.com