PCANY MONTHLY NEWSLETTER

PRECAST CONCRETE ASSOCIATION OF NEW YORK, INC. *May 2005* *Volume 16, No. 5*

One Day Installation of Three-Sided Culverts

Pomfret Bridge **Photos by Riefler Concrete**

As with all bridges, the replacement and widening of an old bridge which carried U.S. Route 20 over Little Canadaway Creek, Town of Pomfret, had to be accomplished with minimal traffic interruption. According to Tom Nye, of UCC Constructors in West Seneca, NY, they first installed a temporary bridge of greater span than the existing, thus allowing traffic flow to continue. They next removed the old structure, cast the new footings and raised abutment walls, and then quickly placed the new three-sided culvert members.

Units were pulled together and plumb with the double bolted connections seen in the pictures. Each section was installed with compressible gasket pre-attached, to form a tightly fitting joint, ready for pouring grout material in both the vertical leg and horizontal deck shear keys. Riefler Concrete also cast in female rebar connectors to attach cast-in-place side walls to the structural members, and included the matching reinforcement connectors.

A total of eight units, 7.316m x 2.438m (24' x 8') were supplied, covering a total lay length of 13m (42'-8"). All pieces were set in one day. By installing four units under the temporary bridge, the need for phased construction was eliminated. These 19.75 ton units were cast with concrete designed for 35 Mpa at 28 days (5100 psi), a simple requirement in the precast plant.

Dewberry Receives Four "Best of 2004" Awards

PCANY Professional Member Dewberry, with 31 offices nationwide, including New York City and Rochester, was recognized by the New York Construction Magazine for the following projects:

Springfield Gardens Industrial Park, Project of the Year, Environmental – a drainage project in Queens; Atlantic Terminal, Award of Merit, Office – offices and retail above Brooklyn's Flatbush transportation hub; Route 31 Dualization, Award of Merit, Highway – multi-faceted highway improvement project in NJ; the Sound School Regional Aquaculture Center, Award of Merit, K-12 – a school constructed using the foundation of a sewage treatment plant, with other unique water supply systems for classroom and laboratory space.

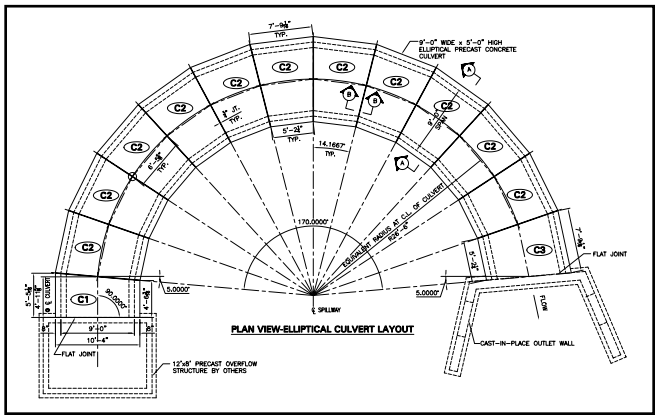
Submit Entries for Leadership PCI Competitions by Aug 15

PCI recently established a program that will assure the continued growth and success of the precast, prestressed concrete industry – **Leadership PCI**. Open to any employee from the ranks of Producers, Associates, and Professional Members with three-years experience, **Leadership PCI** is designed to sharpen participants' skills and abilities by providing management training, industry association experience, and networking opportunities that are vital to successful leadership. Complete data and entry forms may be downloaded from www.pci.org.

Site Improvements in Renowned Sleepy Hollow

Eighteenth-century Philipsburg Manor, once the headquarters of an enormous Hudson Valley milling, farming, and trading complex, now vividly interprets aspects of the history of colonial New York and the system of racially-based slavery which helped keep the estate running.

To facilitate utilization of existing upper and lower on-site storm water holding ponds, and in keeping with the naturalness of the entire complex, a most unusual elliptically-shaped drainage culvert was put in place. It begins with a 12' x 8' precast concrete overflow structure in the upper pond. From there, water flows through the culvert, essentially out of sight until it arrives at the lower pond. As you can visualize from the layout drawing, 13 wedge-shaped units, 9' clear width at the bottom with a rise from 2'-5" to 5'-0", as established by the elliptical slope of the top slab, were placed to construct the semi-circular tunnel.



Culvert Layout Drawing **The Fort Miller Company**

The flow starts here…

goes around here…..

…and comes out here.

Ryan-Biggs Associates, Troy, NY did the design of these unusual shapes for the precaster, The Fort Miller Company of Schuylerville, NY, who in turn supplied to Bradhurst Site Construction, the project contractor.

The beginning and end sections contained cast in dovetail anchor slots for attaching the hand laid local stone, continuing the appearance of other structures at the site. As shown before installation, the pieces were almost too attractive to hide, and surely don't look like the ordinary "box" culverts. But they clearly demonstrate the infinite possibilities achievable with precast concrete shapes.

Elliptical shaped culvert **Photos by The Fort Miller Company**

Lightweight Concrete – Is it for Precast?

By Ronald Thornton, PE
Reprinted from the April 2005 issue of "The Delta Advantage"

Structural lightweight concrete (SLC) was used effectively as early as World War I when the Emergency Fleet Building Corp produced ships and barges with 5000 psi concrete made with expanded shale aggregates. Other early applications included high-rise buildings in the 1920's and the San Francisco Oakland Bay Bridge built in the 1930's.

Structural lightweight concrete, by definition, is made with lightweight aggregates and has an air-dried unit weight at 28 days in the range of 90 – 120 pcf. Lightweight aggregates typically consist of expanded slag, shale, clay or slate. Vermiculite and perlite aggregates can be used to achieve unit weights well below 80 pcf but are typically of very low strength and used for insulating applications.

The typical benefits of SLC include lower foundation and substructure costs as well as improved insulating and fire-endurance properties. Could there be additional benefits to the precast industry? There are several possibilities including increased pay-loads and larger structures with fewer joints to name a few.

SLC is clearly more expensive to produce than normal weight concrete and this cost needs to be *weighed* (no pun intended) against the potential benefits. The numbers are beyond the scope of this article but can be reasonably estimated by individual producers once they have done their homework. The key is to get input from lightweight aggregate suppliers on material costs and mix design recommendations and then consult a structural engineer on potential design implications.

There are many issues to consider in the production of SLC and the design of products using SLC. Here are just a few of these issues:

- Lightweight aggregates are highly absorptive and may require additional water and mixing time to achieve a workable slump. Wetting of stockpiles may also be in order.
- Lower slump and alternate placement techniques may be necessary to avoid segregation during placement.
- The diagonal shear capacity of walls and slabs using SLC must be reduced by 25% (15% for sand lightweight) according to both ACI and AASHTO standards. The reduction may be less, however if the splitting tensile strength of the lightweight concrete mix has been determined through testing.
- The bond between reinforcing steel and lightweight concrete is also affected resulting in greater development lengths and increased lap splices, where applicable.
- The modulus of elasticity of lightweight concrete is less than that of its normal weight counterpart. This may have certain serviceability issues in terms of crack control and deflection.

The design issues stated above may or may not be significant, depending on the unit. They should, however, be evaluated by a qualified structural engineer.

Any decision to use structural lightweight concrete for typical precast products must be based on a thorough analysis of the associated costs and benefits.

Visit www.pcany.org for more information on:

- **precast concrete products** and their application
- **precast concrete producers** with links to their websites
- **precast concrete association of New York, PCANY**

Calendar of Coming Events:

May 16-18	***PCI QC Levels I/II, Nashville, TN***
May 17	***Septic Tank Group, Ramada Inn, Newburgh, 12:00 pm***
May 18	***Joint NYSDOT/PCANY Meeting, AGC Conference Room, Albany, 1:00 pm***
May 19	***PCANY/ABCD Bridge Design Workshop, Ramada Limited, Batavia, 8:00 am***
May 20	***Special NYSDOT meeting with PCI on Plant Certification, DOT Headquarters, 10:00 am***
Sept. 23-26	***NPCA IOC (Industry Outlook Conference), Sarasota, FL***

Producer Member Companies:
AFCO Precast, Middle Island, NY
A & R Conc Specialties, New Windsor, NY
Bayshore Conc Prod, Cape Charles, VA
Binghamton Precast, Binghamton, NY
Carrara & Sons, Middlebury, VT
Coastal Pipeline Products, Calverton, NY
Concrete Building Supply, Plattsburgh, NY
William E. Dailey, Shaftsbury, VT
The Fort Miller Co, Schuylerville, NY
Hanson Pipe and Products, Pottstown, PA
Jefferson Concrete, Watertown, NY
Kistner Conc Products, East Pembroke, NY
Newcrete Products, Parsippany, NJ
Oldcastle Precast, South Bethlehem, NY
Riefler Concrete Products, Hamburg, NY
Roman Stone Const Co, Bay Shore, NY
Rotondo Precast, Avon, CT
Schuylkill Products, Cresona, PA
Sunnycrest Inc. Auburn, NY
Unistress Corp., Pittsfield, MA
LC Whitford Co., Wellsville, NY

Associate Member Companies:
A-Lok Products, Tullytown, PA
Amcrete Products, Newburgh, NY
Concrete Sealants, Royersford, PA
Cresset Chemical Co, Weston, OH
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degussa.Construction Chemicals, Cleveland, OH
Eastern States Steel, Upper Saddle Riv, NJ
Engineered Wire Products, Upper Sandusky, OH
Euclid Chemical Co, Saratoga Springs, NY
WR Grace, Old Chatham, NY
H & H Hulls, Hudson, NY
Helser Industries, Tualatin, OR
Henry Company, Houston, TX
Meadow Burke, Merrimack, NH
Mixer Systems, Pewaukee, WI
O W Hubbell & Sons, New York Mills, NY
Polylok, Yalesville, CT
Press Seal Gasket Corp, Boxford, MA
Jepco Sales, Royersford, PA
JVI Inc, Pittsfield, MA
NPC Inc, Milford, NH
Oilchem Inc, NH Marrimack, NH
A L Patterson, Fallsington, PA
Rebar Systems, Cotuit, MA
Sika Corporation, Fairless Hills, PA
Spillman Company, Columbus, OH
Splice Sleeve N A, Bonita Springs, FL
Stelcrete Industries, Niagara Falls, Ontario
Syracuse Castings Sales Corp, Cicero, NY
TUF-TITE, Lake Zurich, IL
USF Fabrication, Durham, CT
E-Z Set, Haymarket, VA

Septic Tank Producer Companies:
Burnett Concrete Products, Wolcott, NY
Butts Concrete Products, Masonville, NY
Eastern Precast Co, Brookfield, CT
Grimm Build Materials, Green Island, NY
Guardian Block, Schenectady, NY
Hoyte's Concrete Products, Rome, NY
Keeler Vault, Hudson, NY
Oneonta Block, Oneonta, NY
R Deso, Inc Champlain, NY
Woodard's Concrete Products, Bullville, NY
Zeiser Wilbert Vault, Elmira, NY

Professional Member Firms:
Abate Engineers, Buffalo, NY
Advance Testing, Stockbridge, MA
Barton & Loguidice, Syracuse, NY
Bay Saver, Mount Airy, MD
A.S. Bell Engineering, Slingerlands, NY
Bergmann Associates, Rochester, NY
A L Blades, Hornell, NY
Clough Harbour & Assoc, Albany, NY
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Delta Engineers, Binghamton, NY
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Greenman-Pederson Inc, Albany, NY
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PCANY Culvert Design Program Version 3.2.0 Released 3-30-05

All holders of Version 3.1. have been sent this new release, which corrects an error (on the conservative side) when calculating the Load Rating in Load Factor Design. The error arose from using only the Ultimate Moment capacity of critical sections in calculating the Load Ratings, when, in fact, the program chooses the moment reinforcement based on the interaction between axial force and moment as described the User Manual. The Load Rating needs to be calculated using the Allowable Moment capacity as calculated with the axial force that occurs with the live load positioned for the maximum moment effect at the critical section. Users should revisit the revised User Manual for further information.

Welcome to New PCANY Members

A. S. Bell Engineering, PC, Slingerlands, NY
Mixer Systems, Inc., Pewaukee, Wisconsin
Tuf-Tite, Inc., Lake Zurich, Illinois
Meadow Burke, Merrimack, New Hampshire
Henry Company, Houston, Texas
Finley Engineering Group, Inc., Tallahassee, Florida
Greenman-Pederson, Inc., Buffalo, New York
Wilbur Smith Associates, Inc., Latham, New York