May 2001, Volume 12, No. 5

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"Precast Concrete is durable, economical and constructable."
Monolithic sound walls with colored concrete finishes on two sides, used to new heights on Long Island Express

Precast monolithic sound walls with architectural colored finishes on the front and back sides were used to new heights on a recently completed section of the Long Island Expressway. The one piece panels were installed vertically between posts set 12’ o.c., to eliminate the joints that are necessary when panels are set horizontal.

The project required 110,000 sf of panels with wall heights up to 28’. They were cast with integrally colored beige concrete with a split block finish on the traffic side and a stained red brick finish on the community side. A two ft. deep fluted cap was cast on the top of the panels. The 16”x14” posts were finished and colored to match the panels.

All exposed surfaces were treated with an anti-graffiti sealer before delivery. The contractor was able to install 50 posts per day using a special base plate with drilled in anchor bolts.

The project was located between Exits 32 and 36 on the LIE in Nassau County, NY. NYSDOT is the owner, and Ammann & Whitney was the consultant. The Defoe Corp. from Mt. Vernon, NY, was the general contractor. Hanson Pipe and Products cast the panels and posts at their plant in Pottstown, PA.
Infrastructure scores a dismal grade of D+ in latest ASCE report

America's infrastructure has scored a dismal grade of D+ in the latest ASCE survey and report card that was released at a press conference in Washington on March 8th. This is a negligible improvement from the D that it received in 1998.

The survey evaluates 12 categories of infrastructure on the basis of their condition and performance, their capacity in relation to need, and their funding also in relation to need. A panel of 11 well respected civil engineers issued the following report card:

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<th>Categories</th>
<th>Grades</th>
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<tr>
<td>Roads</td>
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<td>Bridges</td>
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<td>Mass Transit</td>
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<td>Aviation</td>
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<td>Schools</td>
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<td>Dams</td>
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<td>Solid Waste</td>
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<td>Hazardous Waste</td>
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<tr>
<td>Navigable Waterways</td>
<td>D+</td>
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<tr>
<td>Energy</td>
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The report notes that 33% of our major roads are in poor or mediocre condition, 29% of our bridges are structurally deficient or functionally obsolete, 75% of our schools are inadequate to meet needs of the students, and 16,000 wastewater systems are over 100 years old and face enormous needs.

The demands of enormous growth in population and an aging infrastructure are outpacing the ability of our nation to build and maintain infrastructure. The report can be viewed on the web at: www.asce.org/reportcard.
Composite action of precast / CIP decks confirmed by tests

Full composite action of precast 4” thick lightweight concrete panels with a 4” thick cast-in-place normal weight overlay, and no special treatment of the joints has been confirmed by recent testing at the University of Texas in Austin. The testing is reported in the Q/A section of the January / February issue of HPC Bridge Views.

Four specimens, including two with a normal weight 8” thick cast-in-place deck and two with the precast panel and overlay were tested. The load-deflection curves and strengths for each pair were almost identical. Strain gages placed across the width of the slabs showed the full width was effective for both the full thickness cast-in-place and the composite precast panel deck. Failure was also identical for both cross sections.

For more information on the tests contact Ned H. Burns at the Univ of Texas; nedburns@mail.utexas.edu.
PRESS confirms the strongest building on earth

A new CD-ROM with information on the ten year research project called PRESS, (Prescast Seismic Structural Systems) presents details of the ductile frame and shear wall systems that were seismically tested on a 60% scale, five story building at the University of California San Diego, last year. Unusual ductility and elasticity, in the structure, was achieved by inserting continuous pretensioned cables through the beams and columns.

**Loads exceeded requirements**
In the shear wall direction, the test structure was subjected to 50% higher loads than UBC Zone 4 requirements and the behavior was excellent with minimal damage to the structure. In the frame direction, the building was taken to drift levels up to 4.5% which is an earthquake that occurs every 2,500 years. There was no strength loss and very little damage to the structure.

A CD-ROM and other information about in-house technical seminars is available from PCI-New England Region at 888-700-5670 or at their web site at [www.pcine.org](http://www.pcine.org). You may also visit PCI at [www.pci.org](http://www.pci.org).
Box culvert design standards available from ASCE

Two new box culvert design standards are available from ASCE, the American Society of Civil Engineers. They can be ordered on the ASCE website at [www.pubs.asce.org](http://www.pubs.asce.org).

- Standard Practice for Direct Design of Precast Concrete Box Sections for Jacking in Trenchless Construction, ASCE 28-00, Stock #40497, list $45 / members $33.75.
- Standard Practice for Direct Design of Buried Precast Concrete Box Sections, ASCE 26-97. Stock #40472, list $49 / members $36.75.

Standards for design and jacking of precast concrete pipe are also available, along with 1500 additional standards and titles on the ASCE Online Bookstore.
GFRP bridge deck design unique and challenging

A replacement bridge deck with glass fiber-reinforced polymer, (GFRP), bars which was recently built by TxDOT was a unique and challenging design for the engineer. Recognizing the potential of FRP bars to solve the problem of corrosion-induced deck deterioration, TxDOT was awarded a TEA-21 grant as part of the Innovative Bridge Research and Construction Program.

The GFRP bars were used in the top mat of the deck which was cast on precast slabs with epoxy coated bars. GFRP bars are susceptible to attack by the moisture and alkalinity of concrete. One of the most important functions of the polymer (plastic) that surrounds glass fibers is to protect the fibers against such attack. Accelerated aging tests have suggested a loss of strength from attack over time, but there was no consensus for the loss that should be allowed for in a design.

Design Guide for FRP Bars
Using a draft of the Guide for the Design and Construction of Concrete Reinforced with FRP Bars to be released by ACI in the near future, the designer based the design essentially on two serviceability criteria rather than stress. The first was to limit service stress to 25% of bar strength, and the second was to limit crack width so as to minimize corrosion in the steel reinforcement of the precast slabs.

Until standard test methods for short and long term strengths of FRP bars are developed, design engineers should be circumspect when incorporating manufacturers’ reported strength into the design of decks. The design guide notes above will incorporate factors based on fiber type to allow for strength reductions over time.
Binghamton Precast and Jefferson Concrete . . .

. . . were recipients of Safety Awards of Merit for the year 2000 at the recent NPCA Annual Convention held in Charlotte, NC. Both companies are Producer Members of PCANY.
Precast pile caps win CIB award for LaGuardia project

Precast concrete pile caps were used on a recent project to strengthen the over water taxiway deck structures at LaGuardia Airport in New York City. The project received an Award of Merit from the Concrete Industry Board at their annual Corbetta Awards Dinner.

The caps were installed on top of steel piles which had been driven through the existing deck superstructure. A precast girder spans between the caps. In order to assure durability in the harsh marine environment, a corrosion inhibitor, silica fume and slag were included in the mix design.

The Port Authority of NY & NJ is the owner. John P. Piccone Inc. was the general contractor. A total of 348 pile caps were cast by Schuylkill Products at their plant in Cressona, PA.
PCANY day at the races at Saratoga on August 29th . . .

. . . will include bus transportation to and from Albany, seating at the "Rail Pavilion" at trackside, and a continuous buffet. Contact PCANY for details.
Checking flotation for underground precast structures

Spring runoff is a time for high water tables and a reminder for checking flotation when designing underground precast structures. Chapter 7 of the *Precaster’s Notebook*, published by NPCA and edited by Gary K. Munkelt, PE, can be helpful for solving flotation problems.

Flotation occurs when the resisting forces are less than the buoyant force. A "Factor of Safety" from 1.1 to 1.5 is acceptable depending on reliability of jobsite information and judgement of the engineer. Resisting forces can include weight of the walls and slabs, inverts, equipment inside the structure, soil on extended shelves of the bottom slab, and friction of soil to soil surrounding the structure. Contact a PCANY Producer Member for a copy of the notes.
Subcommittee for self-compacting concrete formed

A subcommittee has been formed as part of ASTM Committee C-9 to develop test methods for self-compacting concrete, (SCC). This new type of concrete which is achieved with the addition of special admixtures, has high fluidity without aggregate segregation. As a result, no internal or external vibration is required during casting.

Several PCANY Producer Members report excellent results with compressive strengths and air content using self compacting concrete. A PCANY September 2000 newsletter story reported details of SCC.
Dismal infrastructure grades: views by the editor

The dismal grades for our infrastructure, as noted in the article, are the result of shortfalls in funding for our again transportation systems, water and wastewater systems, schools, dams, and energy systems. We encourage everyone to visit the ASCE website report card at www.asce.org/reportcard to learn more about specifics of the report.

ASCE President Robert W. Bein has noted that the nation had been seriously underinvesting in the infrastructure for decades. James E. Davis, ASCE Executive Director noted that the downward trends can be reversed with increased funding and a renewed partnership involving citizens and the local, state, and the federal governments. The report estimates an investment of $1.3 trillion is needed over the next five years to restore a healthy infrastructure. This is a do-able number at this time, with the nation's projected budget surplus.

Our problems seems to be a current passion for lowering taxes and a greed for rewarding certain industries particularly those in defense and space to the exclusion of all else. The construction industry is so fragmented and appears to be lacking with adequate representation in the major parties. And since infrastructure is a mystery to most of the media (I still fume when I read about precast cement bridges?) we may be suffering from benign neglect, or is it compassionate neglect? At any rate, when the infrastructure is poor, our nation looses in a multitude of ways that effect the nation's economy, health and future.

The late Tip O'Neil, former Speaker of the House, noted that all politics is local. And ASCE has suggested a number of ways for an individual to get involved with renewing America's infrastructure. If you want to help, we encourage you to visit the report card web site and press the "How You Can Help" button.
Calendar of Coming Events

May 3, PCI Zone 5 Meeting
Hyatt Regency Baltimore, Baltimore, MD
  Info: 312-786-0300, Room Reservations: 410-528-1234

May 7 - 8, American Segmental Bridg Institute Seminar
Holiday Inn, Chicago, IL
  Info: 602-997-9964

May 10 - 11, ACI Repair of Concrete, Two Day Workshop
Hilton Dedham Place, Dedham, MA
  Info: 248-848-3815, Room Reservations: 781-329-7900

May 24, ACI Concrete Repair Basics Seminar
Crowne Plaza Hotel, Albany, NY
  Info: 518-732-0374, Room Reservations: 518-462-6611

June 18 - 22, PCI QC Level I & II Schools
Nashville, TN
  Info: 312-786-0300, Email: info@pci.org or Web www.pci.org
Self-Compacting Concrete, (SCC) for placement in thin-walled members or intricate highly reinforced sections

Self-compacting concrete is produced with standard materials and new high-range water-reducing (HRWR) admixtures, combined with stabilizing agents to provide mixes with a lower water-cement ratio (<0.40) and a slump flow of 26" to 28" in diameter as measured flowing from a slump cone. Measuring and observing the slump flow indicates the flowability of SCC and determines consistency and cohesiveness of the mix.

The main advantages of using SCC are that it can be placed in thin walled members or intricate highly reinforced sections. SCC can be pumped from the bottom of a form or dropped from the top. The recommended maximum fall height is 6' although good surface quality has been reported with drop heights of up to 20'.

Similar to regular concrete
The properties of SCC are similar to regular concrete having an equal w/cm ratio. The air content of SCC may vary from 1.5% for non air-entrained concrete to 4 to 6% for air-entrained concrete. SCC produces a fluid, cohesive concrete that moves through formwork without segregation or bleeding, while still maintaining the proper air void distribution.

The set-time of SCC is slightly higher than regular concrete. Durability factors show only minor differences from regular plasticized concrete. Shrinkage is also slightly higher for SCC.

This article is based on a talk by Curt Badman, with Sika Corp, (215-783-3922) on SCC made at the pcany Summer Meeting in Albany on August 30th, and an article on SCC, appearing in the April issue of Concrete International.

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