Sunday, October 5, 2008, 1:30-3:00
S37, Session 1 – Bridge Conference Opening and PCI Bridge Design Awards Presentations
Session Moderator: John S. Dick, J. Dick Precast Concrete Consultant, LLC, Monument, Colo.

Welcome from The Federal Highway Administration
M. Myint Lwin, Director, Office of Bridge Technology, Federal Highway Administration, Washington, DC

PCI 2008 Bridge Design Awards
John S. Dick

Eugene Freyssinet – The Origins of Prestressed Concrete (28)
Kenneth W. Shushkewich, KSI Bridge Engineers, San Francisco, Calif.
It is well known that Eugène Freyssinet was the inventor of prestressed concrete. However, it is not as well known that he was a skilled craftsman and prolific bridge builder, and this is what prepared him to invent prestressed concrete. This paper and presentation describe the journey taken to create this “entirely new material” that led to a “revolution in the art of building”.

Sunday, October 5, 2008, 3:30-5:00

S41, Session 2 – Washington State Department of Transportation Spotlight State Session

Session Moderator: Jugesh Kapur, State Bridge & Structures Engineer, Washington State Department of Transportation, Olympia, Wash.

Spotlight State Keynote Presentation
Jugesh Kapur, State Bridge & Structures Engineer, Washington State Department of Transportation, Olympia, Wash.

Bridge Architecture of the 21 Century – A Bridge Architect's Perspective (09)
Paul Kinderman, State Bridge and Structures Architect, Washington State Department of Transportation, Olympia, Wash.
A discussion of 21st Century trends in bridge architecture. Through case studies of Washington State's mega-projects, the author proposes new perspectives that relate to the modern bridge designer.

Precast Bridge Substructures in Areas of High or Moderate Seismicity (84)
Bijan Khaleghi, Washington State Department of Transportation, Olympia, Wash.
Prefabricated bridge components are in increasing demand for accelerated bridge construction. This paper examines the applicability of the AASHTO LRFD Specifications to precast prefabricated bridges in areas of high or moderate seismicity, discusses the different seismic design methodologies, and provides guidance in their application to precast bridges.

Sunday, October 5, 2008, 3:30-5:00

S42, Session 3 – Bridge Aesthetics and Durability Considerations

Session Moderator: Hank Bonstedt, Prestressed Concrete Association of Pennsylvania, Allentown, Penna.

Design of the Rich Street Bridge in Columbus, Ohio (87)
Frederick Gottemoeller, Bridgescape LLC, Columbia, Maryland, Travis Butz, Burgess & Niple, Inc., Columbus, Ohio and Siegfried Hopf, Leonhardt, Andra und Partner, Stuttgart, Germany
The proposed bridge is a 5-span, 563 foot long structure supported on four lines of concrete arches. The arches are constructed integrally with the bridge's four girder lines so that the resulting structure behaves as a rigid frame. Both the arches and girders consist of precast concrete segments constructed using high strength lightweight concrete.

Aesthetic Modifications to Typical Precast Bridge Products (71)
Keith Kaufman, Knife River, Harrisburg, Ore.
The Oregon Department of Transportation is well into their Bridge Replacement Program. The program has adopted aesthetic standards bridge designers must consider during the structure type selection. This presentation will include fabrication and construction for many projects that have included the aesthetic modifications to typical precast bridge elements in the State of Oregon.

North Avenue Bridge Reconstruction – Field Precasting of a High Performance Concrete Center Span (10)
Alison Smith, URS Corporation, Chicago, Ill.
The 109-ft-long, 4-lane-wide, 800-ton, HPC-center span was shored and formed off-site on three barges. It was floated up river, adjusted into position and jacked up from a temporary structural system consisting of launching trusses setting on temporary piers.

Durability of Lightweight Concrete for Bridges (48)
Reid Castrodale and Ken Harmon, Carolina Stalite Company, Salisbury, N.C.
This paper discusses the factors that contribute to ensuring the durability of bridge decks constructed using lightweight concrete is equal to or better than normal weight concrete. It presents the issues that need to be addressed in project specifications to assure good performance of lightweight concrete bridge decks.

Monday, October 6, 2008, 8:00-9:30

M10, Session 4 – Washington State Department of Transportation Spotlight Topics

Session Moderator: Jugesh Kapur, State Bridge & Structures Engineer, Washington State Department of Transportation, Olympia, Wash.

Precast Bridge Deck Solutions for Rapid Rehabilitation of a Truss Bridge (07)
Jugesh Kapur, State Bridge & Structures Engineer, Washington State Department of Transportation, Olympia, Wash.
The paper describes the replacement of the deck on the Lewis and Clark Bridge using full-depth precast deck panels and self-propelled modular transporters (SPMT) that accelerated construction tremendously.

Effects of Temporary Propping on Design of Prestressed Concrete Bridge Girders (24)
Khashayar Nikzad and Vietanh Phung, TranTech Engineering, LLC, Bellevue, Wash.
During construction, bridge girders in their simply supported state can be temporarily propped prior to deck casting. Pacific Avenue Overcrossing in Everett, Wash., is used as an example to investigate the effects of temporary propping. It is shown that for the same girder cross section and number of strands, temporary propping provides an increase of 20 percent in the span length.

Innovative Design for an Arch Bridge Widening (26)
Yanqiang (Carl) Gao, Seattle DOT, Seattle, Wash.
This project applied state-of-the-art technology with the use of advanced light-weight concrete and a well-planned construction sequence. The result eliminated the need for a complete bridge replacement, therefore shortening the project duration by approximately 4 ½ years, and saving the taxpayers almost $5 million dollars.

Effect of Lightweight Concrete in Seismic Behavior of Bridge (46)
Siddharth Srivastava and Monique C. Hite, Texas A&M University, College Station, Tex.
The primary use of structural lightweight concrete is to reduce the dead load of a concrete structure, which allows the designer to reduce the size of columns, footings and other load bearing elements. This paper mainly focuses on modeling the non-linear behavior of a typical bridge in Georgia subjected to seismic loads.

Monday, October 6, 2008, 8:00-9:30

M11, Session 5 – Bridge Project Studies

Session Moderator: Glenn F. Myers, PBSJ, Ft Lauderdale, Fla.

Design and Construction of I-4/SR 408 Interchange (47)
Fuat Guzaltan and William Hess, HNTB Corp., Orlando, Fla. and Michael Waddell, URS Corp.
A massive reconstruction effort is being undertaken jointly by the Florida Department of Transportation and Orlando-Orange County Expressway Authority to improve the traffic flow at this location. It is being accomplished through the development of a new ultimate four-level interchange comprised of multiple flyovers.

The Lime Kiln Bridge - A Beautiful Marriage (49)
Christopher D. Baker and Mark A. Colgan, VHB-Vanasse Hangen Brustlin, Inc., Bedford, N.H.
Prestressed concrete was an integral component of the replacement of the only open spandrel concrete arch in Vermont, the Lime Kiln Bridge. The design “married” prestressed concrete box beam, prestressed concrete slabs with cast-in-place concrete and resulted in a bridge that replicated the original’s decorative geometrical features.

A Design-Build Bridge Venture in High-Performance Concrete (54)
David W. Wilhite, and Adam S. Davidson, Barge Waggoner Sumner and Cannon, Inc., Nashville, Tenn.
Memphis-Shelby County Airport Authority solicited Design-Build that required a two-lane bridge to cross the eight-lane wide Winchester Road, supporting a special purpose firefighting vehicle with a gross weight of 185,000 pounds. Closely spaced 72-in.-deep prestressed HPC bulb-tee girders enabled the design-build team to develop a preferred single 134-ft-span configuration,

High Occupancy Vehicle HOV SR51 SB and HOV SR51 NB (60)
Dan Shiosaka, Stanley Consultants, Inc., Phoenix, AZ
Freeway-to-freeway HOV ramp connectors, beginning/ending in freeway medians, involve inherently complex bridges. Three nearly identical, level post-tensioned straddle bents carry the bridges over SR101L eastbound freeway lanes, using a unique and innovative strategy never used in Arizona before. The SB Bridge utilizes just the “first” straddle bent – passing clear over the second and third without touching; the NB Bridge utilizes just the “second and third” straddle bents – passing clear over the first without touching.

Monday, October 6, 2008, 10:00-11:30
M20, Session 6 – Accelerated Bridge Construction Part 1
Session Moderator: Susan Lane, Portland Cement Association, Washington, DC.

Utah's Move to Accelerated Bridge Construction as Standard Practice (16)
James McMinimee and Rukhsana Lindsey, Utah Department of Transportation, Salt Lake City, Utah and Mary Lou Ralls, Ralls Newman LLC, Austin, Texas
The Utah Department of Transportation has initiated a structured approach to making Accelerated Bridge Construction their standard practice. To address user needs UDOT has constructed a number of bridges with prefabricated elements and systems.

The Demonbreun Street Viaduct Replacement (30)
Edward P. Wasserman and Houston Walker, Tennessee Department of Transportation, Nashville, Tenn.
The Demonbreun Street Viaduct Bridge replacement project is a classic study of how precast and cast-in-place concrete can be utilized to provide context sensitive needs while delivering a cost efficient solution in a minimum time frame

Testing and Monitoring: Validating Performance of Accelerated Construction, New Bridge Materials and Design/Evaluation Methods (59)
Norm McDonald and Ahmad Abu-Hawash, Iowa Department of Transportation, Ames, Iowa and Brent Phares and Terry Wipf, Iowa State University, Ames, Iowa
In recent years, the Iowa Department of Transportation has focused efforts on investigating the use of new high performance materials, design and construction methods and supplemental maintenance methods. This paper will provide case studies related to field testing and monitoring of precast concrete components and systems.

Rehabilitation and Widening of the State Route 99 Bridge over Interstate 24 in Murfreesboro, Tennessee (36)
Gary S. Henderson, Palmer Engineering, Nashville, Tennessee
This paper presents a description of the rehabilitation and widening of the bridge using precast prestressed concrete girders. In view of the low initial cost of precast prestressed concrete girders, the ability to incorporate the existing substructures into the widened bridge, and the low cost of future maintenance, the new structure is attractive, durable, and cost effective.

Monday, October 6, 2008, 10:00-11:30
M21, Session 7 – Considering Bridge Decks
Session Moderator: Mary Lou Ralls, Ralls Newman, LLC, Austin, Tex.

Long-term Protection of Bridge Deck System with Constructible Fibrous Bonded Latex-Modified Concrete Overlay Having Structural Benefits (03)
Mohammad Alhassan, Indiana University-Purdue University, Fort Wayne, Ind. and Mohsen Issa, University of Illinois-Chicago, Chicago, Ill.
Latex-modified concrete (LMC) overlays have superior performance characteristics over micros-silica concrete overlays and other overlay types. LMC provides unique features critical for fulfilling the functionality of the overlay.

A Low Noise, Large Movement Expansion Joint System for Concrete Bridges (34)
Ronald J. Watson, R.J. Watson, Inc., Amhurst, N.Y. and Xavier Delattre, Granor Rubber & Engineering
Traffic noise generated by bridge expansion joints appears to be an increasing concern for road authorities in the U.S. and abroad, especially in densely populated areas In addition to reviewing the results of this study performed in Australia, this paper will also cover some case histories of this joint system.

Increasing the Durability of Concrete Bridge Decks with Surfacing and Reducing Their Life Cycle Costs (58)
John Hammond, Pavement Innovations Ltd, UK
The project was to develop design criteria and application procedures to further enhance bridge deck waterproofing/thin surfacing composite, thereby increasing bridge durability and reducing life cycle costs.

Improving Tomorrow's Infrastructure: Extending the Life of Concrete Structures with Solid Stainless Steel Reinforcing Bars (76)
Raymond Schnell, Talley Metals, McBee, S.C.
Solid stainless steel rebar will continue to be used in the construction of bridge decks, ramps, columns, and critical structural members. This is seen especially where such materials will be required to withstand the harsh effects of the environment, whether seismic in nature or corrosive.

Monday, October 6, 2008, 10:00-11:30
M22, Session 8 – Bridges with Deck Beams
Session Moderator: Reid W. Castrodale, Carolina Stalite Company, Salisbury, NC

Design and Construction of the South Channel Bridge (75)
Derek Soden, Alaska Department of Transportation and Public Facilities, Juneau, Alaska
The Alaska Department of Transportation is constructing a 700-ft-long prestressed concrete replacement bridge. The new bridge consists of five 140-ft prestressed decked bulb-tee girder spans. This new bridge is illustrative of why the decked bulb-tee girder has been the predominant structure type for new bridge construction in Alaska since the 1970s.

Selection of Closure Pour Materials for CIP Connection of Precast Bridge Deck Systems (81)
Peng Zhu and Z. John Ma, University of Tennessee, Knoxville, Knoxville, Tenn.
With the public's demands for reduced construction time and traveling delays, full-depth precast bridge decks or decked concrete girders should be more widely used and become a standard construction method for bridges. A CIP concrete closure pour completes the deck connection. The selection of closure pour materials is critical. The procedure and method used in the NCHRP Project 10-71 for selecting durable bridge joint materials are discussed to demonstrate guidelines for selecting durable bridge joint materials.

Splicing Decked Precast Girders to Accelerate Bridge Construction (66)
Jimin Huang, HDR Engineering Inc., Tampa, Fla.
A decked girder is a prefabricated element with deck and girder cast integrally as one precast unit. Few examples can be found for their use in spliced girder bridges. This paper investigates rational design techniques used in splicing decked girders to accelerate bridge construction

U-Bar Details with a Small Bend Radius for Longitudinal Connections (83)
Sam Lewis and Z. John Ma, University of Tennessee, Knoxville, Knoxville, Tenn.
This paper focuses on a NCHRP 10-71 study to improve continuous longitudinal joint details for decked precast prestressed concrete girder bridge systems. It proposes to use an inside diameter bend of "3d" rather than 4d for No. 5 bar and smaller. This paper reports the preliminary testing results.

Monday, October 6, 2008, 1:30-3:00
M38, Session 9 – Accelerated Bridge Construction Part 2
Session Moderator: Maher Tadros, University of Nebraska-Lincoln at Omaha, Omaha, Neb. and PBSJ, Tampa, Fla.

September 11 Memorial Bridge – A Sustainable Bridge Solution (42)
Eric Yermack, Arora and Associates, P.C., Lawrenceville, N.J.
Precast piers, cofferdams, columns and pier caps were fabricated offsite, delivered and then assembled using post-tensioning. The use of precast bridge components not only allowed for the bridge architectural concept to be realized, but it resulted in a high quality, sustainable, memorial structure constructed over 700 days ahead of schedule.

Precast Repair of Bridge Approach Slab Support (57)
Dean Bierwagen, Iowa Department of Transportation, Ames, Iowa, Mike LaViolette, HNTB Corp., Omaha, Neb., Ahmad Abu-Hawash, Iowa Department of Transportation, Ames, Iowa, and Terry Wipf, Iowa State University, Ames, Iowa
Bridge owners are frequently faced with the need to replace critical bridge components during strictly limited or overnight road closure periods. This paper presents the development, testing, installation and monitoring of a rapid precast paving support ledge that could be installed quickly using a single overnight bridge closure.

Precast Panels for Deck Replacement at Triborough Bridge, New York (31)
Samia Abdou and Chris Gagnon, Ammann & Whitney, Consulting Engineers, P.C., New York, N.Y.
Over 800,000 square feet of deck area, at the Triborough Bridge, has been replaced with high performance, light weight, precast concrete panels, along both tangent and curved alignments, for a total length of structure of 7200 LF.

All-Precast Construction Speeds Critical Bridge Replacement Project (77)
Robert Larson, Alpha & Omega Group, Raleigh, N.C. and Richard Nickel, Carolina Bridge Company
In the winter of 2008, the North Carolina Department of Transportation replaced seven aging timber bridges along NC 12 on Ocracoke Island, a remote site on NC's Outer Banks. Six of the bridges were replaced with prestressed AASHTO voided slab structures and the seventh replaced with a pipe culvert. The Ocracoke bridges were successfully completed 30 days ahead of the demanding schedule.

Monday, October 6, 2008, 1:30-3:00
M39Session 10 – Segmental Bridges
Session Moderator: Jon Grafton, Pomeroy Corporation, Perris, Calif.

Curvature Effects on Post-Tensioned Segmental Concrete Bridges Constructed by Balanced Cantilever Method (08)
Bo Hu, and Dongzhou Huang, PBS&J, Inc., Tampa, Fla.
This paper investigates curvature effects in post-tensioned segmental concrete bridges erected with the balanced cantilever method and the post-tensioning design method for accomplishing a reasonable force condition under design loads.

Design of the Precast Segmental I-95/I-295 Interchange, Jacksonville, Fla. (33)
Victor Ryzhikov, Antonio Ledesma and Scott Lawson, PB, Tampa, Fla.
The I-95/I-295 North Interchange Project is located north of the City of Jacksonville, Fla. Construction is by the balanced cantilever method. The paper will discuss an economical design solution for bridges with limited amount of precast segments.

Project Case Study- I35W Bridge Reconstruction (37)
Kevin Western, Minnesota Department of Transportation and Thomas DeHaven, FIGG Engineering, Eagan, Minn.
The collapse of the I35W Bridge in Minneapolis was an historic event that was reported on around the globe. This paper focuses on the Minnesota Department of Transportation response to getting a new bridge designed and also the aspects of the new design. The project utilizes HPC and is designed for at least a 100 year life.

The Evolution of Precast Segmental Bridge Construction in the State of Florida (41)
Timothy Barry, Reynolds Smith and Hills CS, Inc (RS&H CS), Jacksonville, Fla,
Over the past six years, the Florida Department of Transportation (FDOT) has made sweeping changes in the design and construction practices of post-tensioned pre-cast concrete structures. This report will focus on one major policy change and the impacts that it has had at a construction project level.

Monday, October 6, 2008, 1:30-3:00
M50, Session 11 – Ultra-High Performance Concrete Plus Integral Abutment Bridges
Session Moderator: Matthew M. Farrar, Idaho Transportation Department, Boise, Id.

Transfer and Development Lengths of Prestressed Beams Cast with Ultra-High Performance Concrete (22)
Royce W. Floyd, University of Arkansas, Fayetteville, Ark., Edmundo D. Ruiz, Universidad De Oriente, Blake W. Staton, Crafton Tull Sparks, Nam H. Do, Fluor Corporation, and W. Micah Hale, University of Arkansas, Fayetteville, Ark.
Ultra-High Performance Concrete (UHPC) is a recent advancement in the concrete industry. UHPC is a type of concrete that possesses superior properties when compared to those of high performance concrete (HPC). This paper looks at performance of prestressing strands in UHPC.

Design of Buchanan County Bridge Using UHPC and PI Beam Cross Section (27)
Dean Bierwagen, Iowa Department of Transportation, Ames, Iowa, Brian Keierleber, Buchanan County, Iowa, Brent Phares, Iowa State University, Ames, Iowa and Ahmad Abu-Hawash, Iowa Department of Transportation, Ames, Iowa
Buchanan County, Iowa, will construct a highway bridge using an optimized PI girder section with ultra high-performance concrete (UHPC). This is the first time the PI section has been used for a highway bridge in the United States. Funding results from the TEA-21 Innovative Bridge Construction Program (IBRC), managed by the Federal Highway Administration (FHWA).

Integral Abutment Bridges – Concrete vs. Steel Superstructures (62)
Joanne Zuo, Parsons Transportation Group, Chicago, Ill. and Joan Zhong-Brisbois, PB
Integral abutment bridges are subject to temperature induced displacement. How far can empirical limits be stretched? In this paper, the authors propose to extend the current length limitations for integral abutment bridges.

Maximum Skew Angle of Integral Abutment (IA) Bridges (68)
Jimin Huang, HDR Engineering Inc., Tampa, Fla.
Through an analytical investigation of mechanism of plane rotation of a skewed IA bridge, this research analytically studies the limit stability condition under thermal movements. This limit stability condition considers many factors. A simplified design equation is proposed to determine the maximum allowed skew angle based on some input design parameters for a typical pile-supported IA bridge.

Monday, October 6, 2008, 3:30-5:00

M45, Session 12 – What is the Value of Time? The Cost of Accelerated Bridge Construction

Session Moderator: Scott Eshelman, Stanley Consultants Inc., Chicago, Ill.

The Cost of ABC in California
Raymond W. Wolfe, Supervising Bridge Engineer, California Department of Transportation, Los Angeles, Calif.

The Cost of ABC in Washington
Jugesh Kapur, State Bridge & Structures Engineer, Washington State Department of Transportation, Olympia, Wash.

Precast Products in California
R. Jon Grafton, President, Pomeroy Corporation, Perris, Calif.

Precast Products in Washington
Millard Barney, Concrete Technology Corporation, Tacoma, Wash.

Monday, October 6, 2008, 3:30-5:00

M47, Session 14 – Bridge Research Topics

Session Moderator: Hossein Ghara, Louisiana Department of Transportation and Development, Baton Rouge, La.

Top Strand Effect (51)
Chris Carroll, Tommy Cousins and Carin Roberts-Wollmann, Virginia Tech, Blacksburg, Vir.
The research project looks at the influence on transfer and development lengths of casting more than 12 in. of fresh concrete beneath the prestressing strands. This is taken into account by ACI and AASHTO for deformed bars, but neglected for prestressing strands.

Assessment of Bavarian State Route Bridges for 60 Tonne Vehicles with Main Focus on Concrete Bridges (64)
Peter Lenz and Konrad Zilch, Technische Universität München, München, Germany
Due to increasing volume of heavy traffic until 2050, European transport industry asks for higher authorized weights and increased maximum authorized dimensions of their transport vehicles in national and international traffic. Within the research project the effects of these 60 tonne vehicles are examined on nearly 3500 existing state route bridges.

A Survey of ASR in Precast Bridges in California (65)
K. K. Sasaki and M. M. Hachem, Wiss, Janney, Elstner Associates, Emeryville, Calif. and D. Cong, Wiss, Janney, Elstner Associates, Inc., Austin, Tex.
To evaluate whether eliminating fly ash in precast concrete products was having detrimental effects on in-service precast girders, a study was conducted that was comprised of 1) sampling and testing for potential ASR reactivity of aggregates, and 2) visual inspection of 120 in-service bridges. This paper summarizes the findings and recommendations of this study.

Performance of Bridge Girders Under Cyclic Torsion And Shear (73)
Gary Greene, Jr., PSI, Turner-Fairbank Highway Research Center, McLean, Vir. and Abdeldjelil Belarbi, Missouri S&T, Rolla, Missouri
This paper describes an experimental program that explored the effect of cyclic torsion and cyclic torsion combined with shear on the performance of reinforced concrete box girder bridges. This research is important because torsion can occur in curved box bridges under gravity loads and torsion could become a significant action during seismic events.

Tuesday, October 7, 2008, 8:00-9:30

T15, Session 15 – Bridge Design and the LRFD Specifications

Session Moderator: Susan E. Hida, California DOT, Sacramento, Calif.

The Dilemma of Prestressed Girder Camber Variability (39)
Maher Tadros and Prasan Purisudh, PBS&J, Tampa, Fla.
It has been common knowledge that precast prestressed girder camber at prestress release and at time of erection can vary significantly. This paper addresses several camber issues related to prediction, design and construction.

A Review of Shear Rating Procedures (12)
David Liu, Shaoyun Sun and Roger Winkelmann, Parsons, Chicago, Ill.
The LFD procedure for shear rating in negative moment region is quite different among DOTs. This study finds the selection of shear rating procedure could change the scope of work and affect the cost associated with rehabilitation of prestressed concrete I-beam bridges.

Reliability of Bridge Structures and Their Design Load (44)
Reynaldo Pablo, Indiana University-Purdue University Fort Wayne, Fort Wayne, Ind.
Vehicles exceeding truck weight limits are permitted to cross many bridges. As heavier loads cross bridges, the design load may need to be adjusted to maintain an acceptable safety margin. This paper examines the safety and reliability of selected bridges. A new design load is developed as a response to the observed vehicular overloads.

I Girder Bearing Design for Improved Stability (38)
Maher Tadros, PBS&J, Tampa, Fla.
A number of bridge spans approaching 200 feet have recently been completed, using girders that are 6- to 8-ft deep. Using narrow, thick elastomeric bearing pads has resulted in reduced stability and the possibly of the girders “tipping over.” This paper attempts to review bearing pad design, detailing and specification.

Tuesday, October 7, 2008, 8:00-9:30

T16, Session 16 – Self-Consolidating Concrete in Bridges

Session Moderator: Thomas Macioce, Pennsylvania DOT, Harrisburg, Penna.

Making Precast Concrete Mixtures More Sustainable with Byproduct Fine Aggregate (05)
L.K. Crouch and J.D. Self, Tennessee Technological University, Cookeville, Tenn. And Benjamin Byard, Testing, Engineering, and Consulting Services
Precast concrete mixtures using byproduct screenings as fine aggregate, instead of river sand; increase the use of post-industrial byproducts from approximately 4 percent by mass to 35 and 39 for conventional and self-consolidating mixtures, respectively. Sustainability was greatly increased for a small sacrifice in performance.

Transfer and Development Length of High Strength SCC Beams (25)
Royce W. Floyd, University of Arkansas, Fayetteville, Ark., Blake W. Staton, Crafton Tull Sparks, Edmundo D. Ruiz, Universidad De Oriente, Nam H. Do, Fluor Corporation, and W. Micah Hale, University of Arkansas, Fayetteville, Ark.
Self-Consolidating Concrete (SCC) is a type of concrete that can be placed without consolidation and is beginning to be widely accepted. This research program compares the measured transfer and development lengths of SCC members to those of conventional high strength concrete.

Prestress Loss Behavior of High-Strength, Self-Consolidating Concrete Girders Subjected to Elevated Compressive Fiber Stresses (74)
J. Brewe1 and J.J. Myers, Missouri University of Science and Technology, Rolla, Missouri
Current codes limit the extreme compressive fiber stress of prestressed concrete members to 60% of the concrete strength. Six prestressed concrete girders were subjected to elevated compressive fiber stress levels ranging between 70% and 90% of initial concrete strength at prestress release. Results of this study are presented in this paper.

Flexural Behavior and Prestress Loss of a Full-Scale Self-Consolidating Concrete Precast Girder (78)
Y.H. Kim, David Trejo and Mary Beth D. Hueste, Texas A&M University, College Station, Tex.
This research investigated the flexural capacity and bond properties of a precast, prestressed bridge girder containing SCC with a composite cast-in-place concrete deck and compared these results with those obtained for a similar system containing conventional concrete.

Tuesday, October 7, 2008, 10:00-11:30

T22, Session 17 – Pedestrian Bridges Plus Deck Panels

Session Moderator: Mark W. Richardson, New Hampshire DOT, Concord, N. H.

Forty Foot Pedestrian Bridge (01)
William Collins, Simone Collins Landscape Architecture, Berwyn, Penna., John Ruff, QBS International Inc, Bashar Qubain, GeoStructures Inc. and Kristen York, McMahon Associates Inc.
Forty Foot Pedestrian Bridge is a new 80-ft-long, $1M signature span over a 5-lane state highway, and the "context infrastructure" centerpiece of a redeveloping town center.

Wichita Riverfront Pedestrian Bridges (13)
Frank P. Blakemore, HNTB Corporation, Kansas City, Missouri
As part of a bike and pedestrian transportation system and the riverfront development program in Wichita, Kansas, two cable-stayed pedestrian bridges were constructed that spanned 320 feet and 240 feet to provide access across the confluence of the Arkansas and Little Arkansas Rivers.

I-5 Beltline (Gateway) Pedestrian Bridge, Eugene and Springfield, Oregon(32)
Gary E. Rayor, OBEC Consulting Engineers, Eugene, Ore. and Jiri Strasky, Consulting Engineers, Greenbrea, Calif.
The authors' paper will discuss the design and construction of this innovative bridge; opportunities and cost efficiencies presented by the use of precast concrete structural elements; and demonstrate how precast concrete construction allowed for rapid and safe bridge construction over a busy interstate freeway without traffic interruption.

Recommended Guidelines for Full-Depth, Precast Concrete, Bridge Deck Panel Systems (17)
Sameh Badie, The George Washington University, Washington, DC, Maher Tadros, University of Nebraska-Lincoln, Omaha, Nebraska, and Rachel Usdan, Design Engineer
The paper presents a summary and discussion of the guidelines developed in the NCHRP 12-65 project, regarding design, detailing, construction and handling of full-depth precast deck panel systems. The discussion will concentrate on the issues that typically hold design engineers back from using precast deck panel systems.

Tuesday, October 7, 2008, 10:00-11:30

T24, Session 19 – Bridge Repair & Rehabilitation

Session Moderator: David Deitz, Palmer Engineering, Winchester, Ken.

Vacuum Grouting Repairs for Existing Post-Tensioned Structures and New Construction (02)
Guy Dickes, Constellation Group LLC, Baltimore, Maryland
Vacuum grouting is a repair technique that bridge builders and repair specialists need in their toolbox. It is not a cure-all for poor workmanship or design, but in the hands of a skilled technician, can repair many problems once requiring tear out and/or replace techniques.

Bridge Multi-Column Piers Rated by the Strut and Tie Method (15)
Robert Bondi and Richard Schoedel, Michael Baker Jr., Inc., Moon Township, Penna.
This project study represented a unique challenge for rating severely deteriorated substructure, multi-column piers by the strut and tie method to obtain acceptable ratings so the bridge did not require closing and substructure units could be rehabilitated under traffic to extend the bridge service life several years until the bridge can be replaced.

US-24 over Lower Rouge River, Innovations Reduce Cost and Schedule (18)
Robert R. Breen, Wade Trim Associates, Inc., Taylor, Mich.
This bridge was built in 1936 and widened in 1957 to carry six lanes of traffic over the Lower Rouge River. An alternative design approach was proposed that used a post-tensioning system with an engineered backfill to reuse the bridge's existing concrete abutments instead of replacing them.

Inspection & Structural Evaluation of the William Powell Bridge in Miami-Dade County, Florida (35)
Daniel Kent, and Brad Bell, Gannett Fleming, Westerville, Ohio
This paper and presentation describes the inspection and evaluation of unique pier cap cracking on the William Powell Bridge in Miami, Florida. The presence of unanticipated cracks in the pier caps raised concern regarding the integrity of the structure.

Tuesday, October 7, 2008, 1:30-3:00

T32, Session 20 – Bridge Deck Panels Plus Seismic Design

Session Moderator: Julius Volgyi, Virginia DOT, Richmond, Va.

Recommendations for Longitudinal Post-Tensioning in Full-Depth Precast Concrete Bridge Deck Panels (55)
Susan Bowers, Whitman, Requardt and Associates, Carin Roberts-Wollmann and Tommy Cousins, Virginia Tech, Blacksburg, Vir.
Full-depth precast concrete panels offer an efficient alternative to traditional cast-in-place concrete for replacement or new construction of bridge decks. To fulfill the needs described, a study was undertaken to determine the initial level of post-tensioning required in various deck panel systems in order to maintain compression in the transverse panel joints until the end of each bridge's service life.

Innovative Approach to Aesthetics and Accelerated Construction of the 24th Street Bridge (56)
Ahmad Abu-Hawash, Iowa Department of Transportation, Ames, Iowa, Hussein Khalil, HDR Engineering Inc, Omaha, Neb., Norm McDonald, James Nelson and Kimball Olson, Iowa Department of Transportation, Ames, Iowa, Brent Phares, Iowa State University, Ames, Iowa, and Phil Rossbach, HDR Engineering Inc, Omaha, Neb.
The focus of this pace-setting structure is aesthetics and accelerated construction. Many innovative features were made possible with the help of funding from the Highways for Life (HfL) and Innovative Bridge Research and Deployment (IBRD) programs of the FHWA.

Stopper-Bearing System: a Solution to Displacement Control of Bridge Decks (61)
Yi-Te Tsai and Monique Hite, Texas A&M University, College Station, Tex.
To ensure the functionality of a bridge struck by major earthquakes, behaviors of a bridge under strong ground motion are studied with particular emphasis on bridge bearings and how they perform during and after extreme events. A new bearing system equipped with a stopper is proposed to limit the horizontal displacement of deck to a desired range.

Analytical Assessment of Cellular Foundations for the Seismic Retrofit of the Dumbarton Bridge (63)
Ahmed M.M. Ibrahim, Foued Zayati and Tariq Masroor, California Department of Transportation, Sacramento, Calif.
Of particular interest in this paper is the seismic assessment of the cellular foundation structures located at the ends of the main channel crossing. Results for two models are presented and a retrofit strategy for this foundation structure is concluded.

Tuesday, October 7, 2008, 1:30-3:00

T33, Session 21 – The Art of Spliced Girder Bridges and Prestressed Piles

Session Moderator: David Hohmann, Texas DOT, Austin, Tex.

The Standardization of Existing Spliced Girder Systems (06)
Hugh D. Ronald, Rapid Precast Construction Systems, Eustis, Fla. and Don Theobald, Gulf Coast Pre-Stress, Pass Christian, Miss.
For a number of standardized girders many tools and references are available to determine the maximum practical span and spacing of the sections. Girder sections and forms used for the St. George Island, Bay St. Louis, and Biloxi projects appear to be well suited to a wide range of spans, from 200 ft to 290 ft.

Design and Construction of the Bijou Avenue Bridge over Monument Creek (23)
Gregg A. Reese, Summit Engineering Group, Inc., Littleton, Colo.
The new Bijou Avenue Bridge is a gateway structure and the major access into downtown Colorado Springs. The bridge has several innovative design features that were developed to facilitate a shallow structure depth over active rail lines with an accelerated construction schedule.

Spliced Girder Bridges over the Intracoastal Waterway (40)
Teddy Theryo and Bryce Binney, PB, Tampa, Fla.
This paper highlights spliced girder bridges over the Intracoastal Waterway designed by PB. Major points are: construction staging, falsework scenarios for precast elements, design issues for individual precast elements, fabrication issues, post-tensioning orientations, and grouting.

Finite Element Modeling of Hollow Precast Prestressed Reinforced Concrete Piles (29)
S. M. Greenwood, W. F. Cofer, M. A. ElGawady and D. I. McLean, Washington State University, Pullman, Wash.
Previous research has shown that hollow concrete piles have a non-ductile response under dynamic loading. In order to understand the dynamic response and failure mechanisms for piles of this configuration finite element analyses were performed and are presented.

Tuesday, October 7, 2008, 3:30-5:00
T41, Session 22 – Bridge Design, Materials and Repair
Session Moderator: Bruce Johnson, Oregon DOT, Salem, Ore.

Development of the Northeast Extreme Tee Beam for Accelerated Bridge Construction (79)
Michael P. Culmo, CME Associates, Inc., East Hartford, Conn. and Rita Seraderian, PCI Northeast, Belmont, Mass.
The Northeast Region of PCI has recently developed a standard for a new beam called the Northeast Extreme Tee Beam or NEXT Beam. The goals of this new section are to provide a fast construction option for variable width bridges with spans up to 90 feet. The paper summarizes the design criteria and how the committee accomplished those goals.

Spencer Creek Bridge – Precast Concrete Provides Major Components for a Deck Arch Bridge on Oregon's Scenic Coastal Highway 101 (70)
Tanarat Potisuk, H.W. Lochner, Inc., Salem, Ore., Keith Kaufman, Knife River, Harrisburg, Ore. and Daniel J. McIntier, H.W. Lochner, Inc., Salem, Ore.
The superstructure includes composite precast voided slabs that are detailed for live load continuity. High performance concrete and stainless steel reinforcement combined with precast prestressed elements were specified to increase life expectancy of the new bridge and minimize impact to the environmentally sensitive creek.

FHWA Research Program on Lightweight High Performance Concrete – Transfer Length (72)
Gary Greene, Jr., PSI and Benjamin Graybeal, FHWA Turner-Fairbank Highway Research Center, McLean, Vir.
Using lightweight concrete in bridge decks and girders can reduce the dead load carried by the superstructure and substructure, thus allowing for longer spans and/or smaller members. FHWA has recently completed the fabrication of 27 prestressed lightweight high-performance concrete (LWHPC) girders. This paper describes the results of prestress transfer length measurements made on the girders.

Shear Strengthening of Reinforced Concrete Bridge Girders with FRP Laminates (80)
Adel ELSAFTY, University of North Florida, Jacksonville, Fla.
This research investigates the effectiveness of using FRP laminates in strengthening bridge girders in shear. Two groups of reinforced concrete girders have been tested.

Tuesday, October 7, 2008, 3:30-5:00
T42, Session 23 – Bridge Project Studies and Design Issues
Session Moderator: Loren Risch, Kansas DOT, Topeka, Kan.

The Replacement of the I-10 Bridges over Escambia Bay Accelerated Bridge Design and Construction Delivered Using the Design Build Method (52)
Charles Rudie, John Poulson, Theodore Molas and Victor Ryzhikov, PB, Tampa, Fla.
The devastating effects of Hurricane Ivan on the existing 2.6 mile long bridges carrying I-10 over Escambia Bay required an emergency replacement. The team developed an approach to deliver over five miles of bridge in approximately two years; an average of 2,000 square feet of bridge constructed per contract day.
Potential Impact of 0.7-in.-Diameter Strands on Precast/Prestressed Concrete Bridge I-Girders: Spacing of Large Diameter Strands (82)
Jayaprakash Vadivelu and Z. John Ma, University of Tennessee, Knoxville, Knoxville, Tenn.
Using 0.7-in. strands, more prestress force can be introduced to the section compared with 0.5-in. and 0.6-in. strands, which can help in design of long-span bridges. It was found that BT-54 with 0.7-in. strands had the same span capacity as BT-72 with 0.6-in. strands. This shows that there is a considerable reduction in the section size when 0.7-in. strands are used.

Take Advantage of Post-Tensioning In Precast Concrete Bridges (43)
Lawrence Yegge, L. Yegge & Associates, Lincoln, Calif.
The availability of concrete mixes having compressive strengths of 10,000 psi and more opens opportunities to extend the economical use of precast bridge members. Using post-tensioning tendons to supplement pretensioned strand can be a valuable solution.

Project Case Study – Conrac Automated People Mover (APM) (53)
John A. Heath and Gary B. Lineback, Heath & Lineback Engineers, Inc., Marietta, Georgia and Brian K. Adams, Heath & Lineback Engineers, Inc., Carrollton, Georgia
The City of Atlanta is in the midst of a massive expansion at Hartsfield-Jackson Atlanta International Airport. The City elected to procure the APM through the design-build-operate-maintain (DBOM) procurement method. Precast is combined with cast-in-place concrete, some light weight, to solve this unique design challenge.