Editorial

YOU ARE INVITED TO THE SYMPOSIUM II

Since the first editorial inviting you to the First ASBI International Symposium on Future Technology for Concrete Segmental Bridges in the January, 2008 newsletter, most of the details of the symposium have been finalized:

The symposium program was printed and distributed to the ASBI mailing list on May 1. If you misplaced your copy, the program is available on the ASBI website http://www.asbi-assoc.org/files/news/symposium/ASBI_Symposium08.pdf

For the first time, ASBI is offering credit card payment with online registration https://www.asbi-assoc.org/news/symposium/registration.cfm. We encourage you to use the credit card registration option. A system generated receipt and confirmation is sent directly to your email address.

Hotel reservations for the Fairmont may be made online http://www.fairmont.com/EN_FA/Reservations/ReservationAvailability?hc=SAF&pc=GRSBI1 ASBI Internet Group Code

The bridge tour was redesigned to provide maximum visual impact of the San Francisco-Oakland East Bay Bridge aboard the San Francisco Spirit (photo above). The San Francisco Spirit, one of the most luxurious yachts on the San Francisco Bay, will accommodate up to 500 guests. A cash bar and complimentary hors d’oeuvres and will be available during the boat tour. The tour will depart the hotel lobby at 2:15pm on Nov. 19 and return to the hotel at 6:00pm.

We believe the First ASBI International Symposium offers outstanding technical and social opportunities in an outstanding location. We hope you will decide to join us in San Francisco, November 17-19, 2008!

Editorial by Cliff Freyermuth
Manager, ASBI
William R. “Randy” Cox has been selected by the ASBI Board of Directors as the new Manager of the American Segmental Bridge Institute effective November 1, 2008. He succeeds Cliff Freyermuth, ASBI Manager since 1989 who will be returning to practice as a Consulting Engineer effective January 1, 2009. Randy will establish a new ASBI office in Austin, Texas which will function in conjunction with the current Phoenix office through a transition period ending December 31, 2008.

Randy is joining ASBI after 27 years of service with the Texas Department of Transportation’s Bridge Division where he gained experience in all areas of bridge engineering. He has served as Director of the Bridge Division and as the Texas State Bridge Engineer for the past 4 years and was responsible for the development of policy, standards, manuals, and guidelines for the design, construction, maintenance and inspection of the state’s 50,000 bridges. Throughout his career he has been active on numerous professional committees, including serving as chair of the Technical Committee for Bridge Management, Evaluation and Rehabilitation for the American Association of State Highway and Transportation Officials (AASHTO) Subcommittee on Bridges and Structures.

ASBI President Ray McCabe is delighted that Randy has agreed to accept the Manager position and believes he will be a great benefit to the organization. “Having been with TxDOT for 27 years and through years of participation in AASHTO and other national organizations, Randy will be able to work with DOT’s, FHWA, and other Bridge Owners to promote the benefits of segmental construction” McCabe states.

Randy brings a wealth of segmental bridge knowledge to ASBI from his experience as a design and construction engineer on segmental bridge projects in Texas. Early during his career with TxDOT, he focused his interests on the design and construction of post-tensioned structures. In 1983 he was in charge of structural inspections for the Bear Creek Bridge which became the prototype for the San Antonio “Y” segmental bridge project. Upon his return from the field, Randy was involved with the superstructure design of the San Antonio “Y” span-by-span segmental bridge project and then provided engineering support during construction. He also provided construction engineering support for several segmental and cable stay projects, including the Veterans Memorial Bridge, a 640 ft. main span precast concrete segmental cable-stay bridge in Port Arthur, the Fred Hartman Bridge, a 1250 ft. main span cable stay bridge in Houston, the US 183 span-by-span segmental bridge in Austin, and several cast-in-place balanced cantilever segmental bridges, including the Galveston Bay Causeway Bridge near Galveston.

In 1999, Randy participated as a team member of the concrete segmental bridge durability scanning tour of Europe sponsored by the Federal Highway Administration. In 2002, he directed the in-service condition inspection of 20 miles of segmental bridges in Texas. As the State Bridge Engineer, his staff has been actively involved in the design and construction of numerous segmental bridges, including 2 bridges currently under construction - the IH 10 Bridge over the Trinity River, a 450 ft. cast-in-place balanced cantilever structure and the Intercoastal Bridge at Matagorda, a 320 ft. main span cast-in-place balanced cantilever structure.

Randy is a strong advocate of the advantages of segmental bridges. “I’m excited to join ASBI at a time when there are major challenges in addressing the condition of the nation’s aging bridges, identifying new sources of transportation funding, and improving mobility in our urban areas. By selecting a segmental bridge, a community can address these issues with a structure that is aesthetic, durable, rapid to construct, and that will have low life-cycle costs. I look forward to working with the ASBI Organization and bridge owners across the nation to develop and promote solutions to solve our nation’s transportation challenges.”

New ASBI Organizational Members

We are very pleased to welcome DOKA, USA, Ltd; F&M Mafco, Inc.; National Precast Concrete Association (NPCA); NRS-USA; Reynolds, Smith & Hills, Construction Services; Strukturas AS; SYSTRA; and Williams Brothers Construction Co., Inc. as new ASBI Organizational Members.

The addresses and contact persons are as follows:

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2008 ASBI Leadership Awards

Five ASBI Organizational Member representatives have been selected for 2008 ASBI Leadership Awards to be presented at the November 19 Awards Luncheon at the International Symposium in San Francisco. The award recipients and the award citations are as follows:

2008 ASBI Leadership Award

Presented to
JOHN CRIGLER

Leadership in development of post-tensioning technology for segmental concrete bridges, in development of ASBI Grouting Certification Training, and as a member of the Executive Committee.

Presented to
LINDA FIGG

Outstanding achievements in development of signature segmental concrete bridge projects in consultation with the communities they serve.

Presented to
RAYMOND J. MCCABE


Presented to
RALPH SALAMIE

Exceptional contributions in the pursuit and construction of segmental and cable-stay bridges.

Presented to
ELIE HOMSI

Exceptional contributions in construction management and development of construction technology for major segmental concrete bridge projects.
Andrea Schokker Named Professor and Head of Civil Engineering, The University of Minnesota, Duluth

Dr. Andrea Schokker, principal technical resource for the ASBI Grouting Certification Training program since 2001, will assume broader responsibilities concerning her primary employment effective with the Fall Semester as Professor and Head of Civil Engineering, The University of Minnesota, Duluth. Andrea will continue to lead ASBI Grouting Certification Training activities in conjunction with her new responsibilities.

Dr. Schokker’s new contact information is:
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2008 and 2009 Grouting Certification Training

The eleventh ASBI Grouting Certification Training event, co-sponsored by the Texas DOT, was held April 14-15 at the J.J. Pickle Research Campus of the University of Texas at Austin. Ninety-three engineers and construction personnel attended the training. A total of 1150 engineers and construction personnel have participated in the training to date. Thirty states now reference ASBI Grouting Certification Training (or equal) in project construction specifications.

The 2009 Grouting Certification Training will be held April 20-21 at the J.J. Pickle Research Campus of the University of Texas at Austin. Registration, program and hotel information for the 2009 training is enclosed and available on the ASBI website www.asbi-assoc.org.

NOW AVAILABLE:

The newly released 2nd Edition Construction Practices Handbook for Concrete Segmental and Cable-Supported Bridges is available for purchase through the ASBI office. The 25 member ASBI Committee worked diligently to revise and update the First Edition based on technical developments since 2004, and input received from the ASBI community.

The cost of the 2nd Edition Handbook is $125 for Organizational Members, $150 for Professional Members and $175 for NonMembers (plus shipping outside the United States).


Sacramento Construction Practices Seminar

An ASBI seminar on construction practices for Concrete Segmental and Cable-Supported Bridges held in Sacramento, CA July 28-29 was attended by 131 engineers and construction personnel. The seminar, based on the “Second Edition of the ASBI Construction Practices Handbook”, was co-sponsored by the U.S. Department of Transportation, Federal Highway Administration. Figures 1, 2, and 3 are representative of the seminar. Seminar presentations were made by the following:

Introduction
M. Myint Lwin, Office of Bridge Technology, Federal Highway Administration

Overview of Segmental Construction
Cliff Freyermuth, American Segmental Bridge Institute

Construction of Precast Segmental Span-by-Span Bridges
R. Kent Montgomery, FIGG

Construction of Precast Balanced Cantilever Bridges
Ben Soule, International Bridge Technologies, Inc.

Construction of Cast-in-Place Balanced Cantilever Bridges
Ralph Salamie, Kiewit Pacific Co.

Construction of Concrete Cable-Supported Bridges
David Goodyear, T.Y. Lin International

Construction of Incrementally Launched Bridges
Marco Rosignoli, HNTB Corporation

Production of Precast Segments
Pat Malone, PCL Construction Services, Inc. and Hunter Collins, PCL Construction Services, Inc.

Equipment for Handling, Transporting and Erecting Precast Segmental Bridges
Elie Homsi, Flatiron Constructors, Inc.
I-35W St. Anthony Falls Bridge, Minneapolis, Minnesota

The Minnesota Department of Transportation created a vision for exceptional quality, aesthetics and speed in outlining the requirements for the new 10-lane Interstate bridge in Minneapolis. The 1,223’ long I-35W St. Anthony Falls Bridge over the Mississippi River in Minneapolis, Minnesota is nearing completion. Notice to proceed with construction.
Figure 7 - (above) Concrete segmental construction as a spectator sport - as many as 1,000 people lined the sidewalk of the adjacent 10th Avenue Bridge as the first superstructure segment was lifted on May 25, 2008. (Photo courtesy of FIGG).

Figure 8 - July 9, 2008 - Erection of the 504’ main span began on May 25, 2008 and was completed just 47 days later, on July 10, placing 120 segments. Notice to proceed with the design/build contract to placing the last precast segments was nine months for this 10-lane interstate bridge. (Photo courtesy of FIGG.)

and access to the site was provided to the design/build team on October 15, 2008. Nine months later, the final segments in the 504’ precast concrete segmental span were erected, on July 10, 2008. The bridge is on schedule to open to traffic in mid-September which will be only 11 months since notice to proceed and more than three months early.

For in depth coverage of the I-35W Bridge, see the Fall, 2008 issue of ASPIRE.

Owner: Minnesota Department of Transportation
Designer: FIGG
Contractor: Flatiron/Manson
Construction Engineer: FIGG
Construction Engineering Inspection: FIGG
Formwork for Precast Segments: EFCO
Post-Tensioning Materials: DSI
Epoxy Supplier and Prepackaged Grout: Pilgrim
Figure 9 - Arch Rib Form Travelers and Temporary Stay Towers. (Photo courtesy of T.Y. Lin International.)

**Hoover Dam Bypass - Mike O’Callaghan-Pat Tillman Memorial Bridge (Colorado River Bridge)**

The Colorado River Bridge at Hoover Dam is taking shape next to the historic Hoover Dam, spanning the Black Canyon between the States of Arizona and Nevada, USA. When complete, the 323 m concrete segmental arch will be the 4th longest concrete arch in the world, and the longest in the United States.

Arch construction is back in full production with replacement of the cable-way and full operation of the segmental arch form travelers (Fig. 9). Both the Nevada and Arizona approach structures are complete, serving now as staging for arch construction.

Form travelers for all four arch rib headings are advancing in synchronized operations. The arch ribs have been cast out to the location of the first temporary stay support, and are now awaiting completion of the temporary stay towers and tensioning of the first sets of stays.

Arch construction is scheduled through next year, with completion of the Bypass scheduled for late 2010.

Progress can be viewed at [http://www.hooverdambypass.org/](http://www.hooverdambypass.org/)
- Hoover Dam Bypass Delivery Manager: Central Federal Lands Highway Division, FHWA
- Colorado River Bridge Designer: T.Y. Lin International w/HDR
- Contractor: Obayashi/PSM
- Construction USA, Inc., a JV
- Construction Engineers: OPAC and McNary Bergeron & Associates
- PT and Stay Supply: Schwager Davis Incorporated
- Form Travelers: NRS-USA

**Devil’s Slide Bridge, California**

Construction of the Devil’s Slide Bridges is finishing up and should be completed by the time this newsletter is published.

The $33 million cast-in-place concrete segmental bridge contract consisted of a southbound box girder bridge with spans of 280’/445’/250’ and a northbound bridge with spans of 229’/445’/224’. (see Figs. 10 and 11)

The main span cantilevers of the southbound bridge were closed at the beginning of this year and the northbound bridge closure was completed in the spring.

Disney Construction has since been concentrating on finish work including placing the unique see through concrete barriers, tubular steel bicycle rails, utilities, seismic instrumentation, and building a cantilevered deck linking the two bridges together near the portal to allow truck and maintenance equipment to make U-turns between the bridge and tunnel portal.

**Kiewit Pacific** continues to excavate the 4000-foot twin bore tunnels from the opposite south portal under a separate contract. Kiewit was provided access to the north portals via the southbound bridge this summer even

Figure 10 - View of the Devil’s Slide Bridges spanning the environmental sensitive valley where construction workers were not even allowed to walk across - June 2008 (Photo courtesy of Caltrans).
Confusion Hill Bridges (a.k.a South Fork Eel River Bridges), California

Segmental construction of the Confusion Hill south bridge superstructure is more than halfway complete (see Figs. 12 and 13). The pier 2 cantilever construction using form travelers began in fall 2007 and was completed this spring. Each cantilever consisted of 17 cast-in-place segments on each side of the pier. The contractor has consistently been constructing a segment pair per week. The bridge consists of spans of 347'/571'/436'.

After completion of the 279-foot cantilevers on each side of pier 2, the travelers were moved to pier 3 to start the process all over. The pier 3 cantilevers are on schedule to be completed this fall.

The project also consisted of a cast-on-falsework slant leg box girder bridge on the north end of the project that was completed in early January of this year. The north bridge has since been used for hauling excavated material from the large cut in the peninsula region between the two bridges.

The $66 million US Route 101 realignment project is expected to be completed in the fall of 2009.

Additional project information and photos can be seen at: http://www.dot.ca.gov/dist1/d1projects/confusionhill/

Owner: California Department of Transportation (Caltrans)
Designer: California Department of Transportation (Caltrans)
Contractor: MCM Construction Inc.
Construction Engineer: Finley Engineering Group, Inc.
Construction Engineering Inspection: California Department of Transportation (Caltrans)
Form Travelers for Cast-in-Place Segments: AVAR
Post-Tensioning Materials: Schwager Davis, Inc.
Bearings and Expansion Joints: DS Brown
Prepackaged Grout: SIKA
Minnesota Crosstown Segmental Bridges Near “Half-Way” Point

The Minnesota T.H. 62/35W Crosstown project includes six curved precast segmental bridges with varying geometry that are under construction employing the balanced cantilever method. All six bridges utilize a modified AASHTO/ASBI/PCI section 8-2 with an 8 foot depth and maximum spans of 200 feet. July 10th marked the day that the Contractor, Lunda Construction, celebrated the halfway point with casting of the 231st segment of projects 462 total segments. The Contractor chose to utilize his existing property by converting one of his buildings into an indoor heated short-line casting facility. Segments are cast, cured, transversely post-tensioned and stored at the casting yard with an approximate 20 mile hauling distance to the bridge site. Casting operations are expected to continue through January of 2009 to complete the casting of all 462 segments. The contractor continues to cast segments at the rate of approximately 2 segments per day with the 260th segment cast and 202 segments to go at the time of this update (Aug 12th).

So far, 146 segments have been erected which has completed approximately 2¾ of the 6 segmental bridges (see Figs. 14, 15 and 16). The first two bridges that were erected are located in a construction staging area that is off to the side of the main traffic area, so these bridges could be erected during normal day time operations. However, the 3rd bridge currently under construction spans over the Interstate and is being erected during brief night-time traffic closures (see Figs. 17 and 18). The Contractor is conservatively erecting 2 segments per night with the interstate closed to traffic between the hours of 10:00 PM and 5:00 AM.

Erection plans for the remainder of this year include completing erecting segments on the 3rd bridge and then erecting the end cantilever spans only of the 4th and 5th bridges to allow for completion of the grading work near the common abutment of these bridges. The Contractor expects to erect segments until freeze up in late November ’08 and then resume erecting segments in April ’09. Completion of the remaining segmental bridges is scheduled to occur in 2009 with much of the remaining construction occurring in highly congested traffic areas.

Since the project criteria requires minimal impact to the traveling public, much of the remaining work of erecting the segments must be completed during either brief night-time traffic closures, or during a limited number of weekend closures. The project is currently on schedule.
Owner: State of Minnesota
Designers: (3 firms designed 2 bridges each) PB Americas, URS, and Parsons Transportation Group
Contractor: Ames, Lunda, Shafer (A Joint Venture)
Construction Engineer: McNary Bergeron & Associates
Construction Engineering Inspection: FIGG Bridge Inspection
Formwork for Precast Segments: Southern Forms, Inc.
Post-Tensioning Materials: VSL
Bearings and Expansion Joints: D.S. Brown
Epoxy Supplier and Prepackaged Grout: Pilgrims Segmental Epoxy and Sika pre-bagged grout

I-76 Allegheny River Bridge, Oakmont, Pennsylvania
The new I-76 Allegheny River Bridge for the Pennsylvania Turnpike Commission is under construction near Pittsburgh, Pennsylvania. Walsh Construction is building Pennsylvania’s first long span concrete segmental bridge. The twin 2,350’ structures are being constructed over local roads, active rail lines, the river and 14-mile island, a state park. The 532’ main span crosses the main channel of the Allegheny River. The bridge is being constructed on an adjacent alignment just south of the existing bridge. Notice to proceed was provided to Walsh on May 17, 2007. The three-year construction schedule, timed to work with major golf tournaments at the adjacent Oakmont Country Club in 2007 and 2010. Bridge design and construction engineering inspection is by FIGG.
Owner: Pennsylvania Turnpike Commission
Designer: FIGG
Contractor: Walsh Construction
Construction Engineer: T.Y. Lin
Construction Engineering Inspection: McTish with FIGG
Form Travelers for Cast-in-Place Segments: NRS-U.S.A.
Post-Tensioning Materials: Schwager Davis Inc.
Epoxy Supplier and Prepackaged Grout: Grout – Sika

Kanawha River Bridge, West Virginia

Although the Interstate 64 bridge over the Kanawha River between South Charleston and Dunbar, W.V. isn’t scheduled for completion until Oct. 29, 2010, the project is already gaining much attention. The cast-in-place concrete bridge will be the longest segmental box girder span in the United States with a total length of 2,975 feet and a main span of 760 feet.

Construction of the $93.6-million Bridge started in May 2007 and is intended to alleviate congestion on the interstate. After completion, the current bridge will be used only for westbound vehicles. In addition to its record-breaking size, the project is unique in that crews will erect the bridge using the balanced cantilever construction method (see Figs. 21 and 22), which has never been used in the construction of a bridge this large in West Virginia. The bridge will be supported by seven piers, four on land and three on the river bank.

Recognizing that the super-elevated structure’s complex geometry (the segments vary from 16 to 38 feet in depth) would create unique formwork challenges, the general contractor for the project, Brayman Construction Corporation of Saxonburg, Penn., turned to DOKA, USA, Ltd. Doka selected custom walers in conjunction with 18,240 square feet (9,120 square feet for each pier) of their Top 50 forming equipment, which is designed to provide easy and efficient forming sequences for large-area projects. The system can be configured for fast and safe stripping of the formwork, after which the interior forms can be immediately reconfigured and rapidly re-set into the next casting. This ease of maneuverability is key since the shape of the bridge and forming needs will consistently change during the construction process. Form travelers for construction of the Kanawha River Bridge are being supplied by STRUKTURAS.

Extending from the Kentucky State line at Huntington, W.V. to the Virginia State line at White Sulphur Springs, I-64 is a multi-lane fully controlled access highway. The four-lane bridge carries approximately 71,500 vehicles per day. Once the new bridge is complete, I-64 will carry six through lanes and two auxiliary lanes between WV 25 at Dunbar and US 60 at South Charleston.

Owner: West Virginia Department of Transportation
Designer: T.Y. Lin International
Engineer of record: T.Y. Lin International
Contractor: Brayman Construction Corporation
Construction Engineer: Finley Engineering Group, Inc.
Construction Inspection: WVDOT - Division of Highways
Form Travelers for Cast-in-Place Segments: STRUKTURAS
Formwork: DOKA, USA, Ltd.
I-39/Kishwaukee River Bridge, Rockford, IL

The Kishwaukee River Bridge Fig. 23 is a post-tensioned precast segmental concrete box–girder bridge opened to traffic in 1980. The bridge has five spans with lengths of 170 ft + 3 x 250 ft + 170 ft (51.8 m + 3 x 76.2 m + 51.8 m). As the first-generation of segmental structures, the Kishwaukee Bridge engineers chose the design of a single shear-key joint usually located close to the centroid of the cross-section. The overall length of the deck is 334 m (1096 ft). The deck was built by the balanced cantilever method. Each cantilever consisted of seventeen segments 2150 mm (7’-3/5”) long and one pier segment 1067 mm (3’-6”) long. Cast-in-place closures have a length of 984 mm (3’-2 3/4”).

The original construction team was comprised of Edward Kraemer and Sons (EKS) who subcontracted with Dywidag Systems International (DSI) as the Post Tensioning designer/supplier. During the original construction contract in the late 1970’s the bridge’s post tensioning system was redesigned by DSI using Dywidag Threadbar® post tensioning systems.

In the early 2000’s the owner; Illinois Department of Transportation (IDOT) decided on a strengthening program to extend the service life of the bridges. The strengthening design developed by Parsons Transportation Group required an addition of a total of twenty four 12-0.6” external post tensioning tendons of various lengths in each bridge. In 2007 IDOT awarded the contract through competitive bidding to the same team as 28 years previously; EKS who again subcontracted with DSI to supply and install the post tensioning. The Owner’s schedule required all work to be completed within a very short time as the owner wanted to keep bridge closure to a minimum due to I-39 being a high traffic route especially for Chicago area residents travelling to Wisconsin during the weekends.

**Challenges:**

1970’s design practice did not require the inclusion of provisions for future additional PT tendons, therefore new deviators had to be constructed throughout the bridges as well as new PT anchorage zones at the diaphragms and abutments. The
new anchor zones and deviators were cast in place within the segmental box and then post tensioned. Instead of using steel pipes at the deviators, continuously curved voids (diablos) were cast in the deviation diaphragm to allow large deviations from the theoretical tendon profile. In order to meet the higher standards of today’s post tensioning technology the PT was designed with a continuous air tight HDPE pipe from anchor to anchor grouted with high performance grout and equipment. Due to the diablos and continuous HDPE pipe requirements; specially designed PT anchors were installed at the faces of the existing diaphragms. The location of the new anchors was made more difficult by the tight constraints of the existing reinforcement and PT.

EKS, IDOT, PTG, and DSI worked very closely throughout the project due to the complex 3D geometry and challenges of accommodating the tendon paths throughout the existing bridges. To assist with this task Ground Penetrating Radar was used to locate the existing PT and reinforcing in the diaphragms and abutments so crews could follow closely behind with coring of the holes (in 3D) for the tendon paths. After casting, the PT install crew quickly went to work installing the new anchors and the HDPE pipe; overcoming the challenges compounded by the largely deviated tendon paths and longer tendons of over 770 feet. The tendon stressing was difficult due to the location of the tendons in the upper corners of the box, along with the congestion of the new tendons and new anchors. (see Fig. 24)

The Southbound Bridge was completed in May 2008 and the Northbound Post Tensioning portion of the project was successfully completed in early August 2008 with final project completion coming shortly within the Owner’s schedule.

**Folsom Dam Bridge, Folsom, California**

The new Folsom Dam Bridge (Fig. 25) is a 970-foot, cast-in-place segmentally constructed bridge 200 feet above the American River canyon below the Folsom Dam. As a Joint Venture lead for the project, CH2M HILL provided environmental document development and approval, alternatives selection, and roadway and bridge design for the 2-mile connector route that will allow traffic to bypass the existing roadway over the Folsom Dam.

The federally funded project, which was administered by the Sacramento District of the U.S. Army Corps of Engineers, was the result of the Bureau of Reclamation’s closure of the existing river crossing, over the Folsom Dam due to homeland security concerns (2003). The American River crossing at this location is an important transportation link for the neighboring communities of El Dorado and Placer counties, and the city of Folsom.

**Project Highlights:**

- Major new bridge crossing downstream from Folsom Dam
- Coordination with state and federal regulatory agencies
- Accelerated bridge construction project that will be completed within 5 years, including planning, design, and construction
- Segmentally constructed post-tensioned concrete bridge construction, with limited falsework, to minimize impact to the environmentally sensitive American River
- Construction Cost $70 million (estimate)

Owner: United States Army Corps of Engineers
Designer: CH2M HILL
Contractor: Kiewit
Construction Engineer: McNary Bergeron
Construction Engineering Inspection: CH2M HILL / URS
Form Travelers for Cast-in-Place Segments: Parkin Engineering
Post-Tensioning Materials: Schwager Davis Inc. (SDI)
Epoxy Supplier and Prepackaged Grout: Sika

Figure 25 - Folsom Bridge Construction (Photo courtesy CH2M HILL).

Figure 26 - Rendering of Folsom Bridge (Drawing courtesy CH2M HILL).
Gulf Intracoastal Waterway Bridge, FM 2031, Matagorda, Texas

The first cantilever is nearly complete on this bridge connecting the remote Matagorda Peninsula to the Texas mainland (Fig. 27). It will soon replace a 50-year old cable-actuated floating swing bridge.

The main span is a relatively modest 320’ and the deck is a narrow 46’ overall. The vertical clearance is 73’ in order to allow for frequent passage of commercial and recreational vessels.

Perhaps the most unique feature on this bridge is the architecture. At mid-span, the box cross-section has a typical segmental box girder cross-section. However the flat-bottomed soffit gradually transitions into a full V-Hull shape at the piers (Fig. 28). The piers themselves have a complimentary beveled shape that creates a mitred corner and unifies the entire structure.

In order to provide sufficient longitudinal flexural strength, the opposing pier V-Hull faces are separated by a single, long web (Fig. 29). The web will also become a reflecting surface for fluorescent lights tucked into the wrapped flanges of the piers. The lighting fixtures are located every 10 feet to create tall windows of light that announce the arrival in Matagorda, TX.

Expected completion of the bridge is Spring 2009.

Fourth Street Bridge, Pueblo, Colorado

Flatiron Intermountain Constructors is building the new 4th Street Bridge in Pueblo, Colorado for the Colorado Department of Transportation. Colorado’s longest highway span at 378’ is being built in concrete segmental construction (Figs. 30 and 31) over the Pueblo Rail Yard which contains 28 sets of heavy rail tracks. The bridge also spans the Arkansas River and a flood protection wall that is celebrated as the world’s longest mural. Bid against steel bridge designs on August 30, 2007, FIGG’s concrete segmental design saved approximately $5 million. Aesthetics were developed to follow the community-selected theme of Natural Environment, along with reflecting Pueblo Heritage.

Correction – The Winter 2008 Newsletter credit listing for the Fourth Street Bridge contained an error in the credit listing for Construction Engineering. Construction Engineering for the Fourth Street Bridge is being provided by Finley Engineering Group.

Owner: TxDOT
Designer: TxDOT
Contractor: Midwest Foundation Corporation
Construction Engineering: Summit Engineering Group
PT Supplier: VSL
Form Travelers: Mexpressa
Prepackaged Grout: Masterflow 1205
Figure 31 - Piers built next to the railroad yard get ready for long span segmental construction. Twin 1,137’ bridges have spans of 151’/237’/379’/228’/142’.

Owner: Colorado Department of Transportation
Designer: FIGG
Contractor: Flatiron Intermountain Constructors

Honolulu High-Capacity Transit Corridor Project on Track

Momentum is building for the Honolulu High-Capacity Transit Corridor Project (HHCTCP).

Plans to issue the first Request for Proposals for Design-Build (DB) contracts for the HHCTCP mega-project for the City and County of Honolulu are well under way. Prequalification documents are expected to be issued this year and Technical and Price Proposals are to be requested in early 2009. The City plans to use a competitive sealed proposal procurement process.

Initially either one or two DB contracts will be solicited for a 7 mile stretch of elevated twin track guideway extending from East Kapolei eastward to Leeward Community College. This work will also include the first of four long span crossings of Interstate H1. This will be closely followed by another DB RFP for the Maintenance Facility. The contracts are part of the First Project which comprises 19.5 miles of guideway from East Kapolei to the Ala Moana Center in downtown Honolulu (Fig. 32). Currently it is anticipated that three subsequent Design-Bid-Build (DBB) contracts will be issued to complete the First Project.

Future proposed extensions include service to Waikiki and the University of Hawaii on the east end, to Kapolei on the west end and service to the airport.

Parsons Brinckerhoff (PB Americas, Inc) is the GEC providing planning and engineering services for the Preliminary Engineering and Environmental Impact Statement (PE/EIS) phase of the project. InfraConsult is the City’s Program Management Support Consultant.

Preliminary engineering indicates that optimal typical span length will be 150ft with erection using span by span assembly and overhead launching gantries. The project will also require a number of longer spans where balanced cantilever construction can be expected with longest spans in range of 300ft. An evaluation of possible cross sections from engineering, aesthetic and cost perspectives indicates that the trapezoidal box section is best suited Fig. 33. However, the DB contractor may be given the flexibility of proposing an alternate configuration subject to compliance with project criteria.

Subsurface conditions in Hawaii vary considerably along the alignment. It is anticipated that 8ft diameter
drilled shafts up to 125ft in length will provide the best foundation option for most of the alignment.

For the most part, the alignment follows existing State and County ROW to limit property acquisition and the majority of the guideway will be constructed in the median of existing roadways. Maintenance and protection of traffic and utility relocations will be significant elements of the work. It is proposed that, for schedule reasons, the initial DB work will also include utility relocations while later contracts may have advance utility work performed under separate utility relocation contracts.

The First Project includes 19 stations. Current thinking is that the stations will be constructed under a separate design-bid-build procurement process to allow maximum participation by local firms.

Ground breaking is expected in late 2009 and completion of the First project is scheduled for 2018.

The First Segmental Bridge in Florida Implementing FDOT Approved Segmental Duct Coupler

The I-95/I-295 North Interchange Project is located north of the City of Jacksonville, Florida. Construction of a new third level ramp bridge which will carry traffic from southbound I-95 to eastbound I-295 is currently underway.

The Ramp SE span arrangement is a ten-span continuous unit. The length of the new bridge is 2256'-4". The corresponding span lengths are: 170' - 229' - 274' - (4 x 249'-10") - 261' - 206' - 117". The horizontal alignment is on a horizontal curve of 1250' baseline radius. The precast segmental box girder has a single cell variable depth box 49 ft wide and will be erected by balanced cantilever method. Box depth varies from 9'-6" at midspan to 12'-0" over the piers. The 10-span bridge is made continuous by longitudinal post-tensioning tendons, with field-cast closure pours near the center of each span.

The use of segmental duct couplers is one of the new requirements in FDOT Specifications Section 462 on post-tensioned bridges to provide improved durability. The special coupler developed by General Technologies, Inc. (GTI) shown in Figures 34 and 35 has been tested and approved by FDOT. Currently, about 25% of segments have been cast and balanced cantilever erection will start around October, 2008.

Owner: Florida Department of Transportation
Contractor: Superior Construction Company, Inc, Jacksonville, FL
Engineer of Record: Parsons Brinckerhoff, Tampa, FL
Construction Engineering Inspections: RS&H CS, Inc., Jacksonville, FL
Post-tensioning System Supplier: Dywidag Systems International (DSI)
Segmental Duct Coupler Supplier: General Technologies, Inc., Tallahassee, FL
Contractor's Specialty Engineer: Corven Engineering Inc., Tallahassee, FL