ASBI

AMERICAN SEGMENTAL BRIDGE INSTITUTE

SEGMENTS

INSIDE

COMMUNICATION NEWS

PROJECT NEWS

Editorial

MOMENTUM AND TEAM CHEMISTRY

Momentum "the big Mo" is an important factor in all sports, as is team chemistry. Momentum and team chemistry are also of vital importance in the construction industry. Considering the geographic distribution and dollar volume represented by projects in the "Project News" of this edition of the newsletter, it appears that segmental construction is doing very well in the momentum department. We expect the upward trend in use of segmental technology to continue in the years ahead. The team chemistry aspect of segmental construction is also developing very well. Some symptoms of this chemistry are reflected in development of new and innovative construction equipment for the San Francisco-Oakland Skyway Bridge, and the Dallas High Five Interchange. A new post-tensioning system was also developed for the Skyway Bridge. ASBI Material Supplier Members have led in the development of anti-bleed prepackaged grouts, and the use of high-energy grouting equipment, both of which greatly enhance the quality of grouting operations.

Research on seismic design of segmental bridges at the University of California San Diego sponsored by Caltrans will provide improved details and give additional momentum to use of segmental construction in areas of high seismicity in the years ahead. Research at the University of Texas at Austin and Pennsylvania State University sponsored by the Texas DOT and the FHWA will further improve corrosion protection technology for future bridges. Penn State is also nearing completion of research sponsored by the Florida DOT and ASBI on traffic vibration effects on grouted tendons.

All aspects of the momentum and team chemistry of the segmental concrete bridge industry will be on display at the November 3-4 ASBI Convention, as described in the convention program enclosed with this edition of the newsletter. Join us in Dallas for an exciting perspective on a rapidly growing component of the construction industry!

Editorial by
Cliff Freyermuth
Manager, ASBI

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New ASBI Member

We are very pleased to welcome **Granite Construction Company** as a new ASBI Organizational Member. The address and contact person are as follows:

Granite Construction Co.
585 W. Beach St.
P.O. Box 50024
Watsonville, CA 95076
(831) 728-7518
FAX: (831) 728-7546
Cell: (831) 594-1405
e-mail: *Brian.Kaub@gcinc.com*
www.graniteconstruction.com
Brian C. Kaub, Area Manager

M. Myint Lwin Selected as Director, Office of Bridge Technology, FHWA

Mary Peters, FHWA Administrator announced Monday, June 16 that **M. Myint Lwin** was selected for advancement into the Senior Executive Service position of Director, Office of Bridge Technology, Headquarters.

Myint recently served as a Structural Design Engineer in the Resource Center, Structures Technical Service Team, Baltimore, Maryland, and is located in San Francisco, California. He was hired in the Western Resource Center in 2000, after working for 35 years in various Bridge Engineer positions in the Washington State Department of Transportation. He served as the Chief of Bridge and Structures for five years. In this capacity, he administered a multi-million dollar budget and led the Office in building and maintaining economical, and durable bridges and structures for the State's transportation system. Myint holds a bachelor's degree in Civil Engineering from the University of Rangoon, Burma, and a masters' degree in Civil Engineering from the University of Washington.

During his time as Bridge Engineer for the Washington DOT, Myint was a member of the ASBI Board of Directors, and he gave the ASBI Convention luncheon presentation at the 1995 ASBI Convention in Seattle. Our congratulations and best wishes to Myint for continued success as Director, Office of Bridge Technology.

2003 ASBI Convention

Enclosed is a copy of the program and registration information for the 2003 ASBI Convention, scheduled November 3-4 at the Hyatt Regency, Dallas, Texas. The convention luncheon presentation will be by **Hala Elgaaly**, Chairperson, ASBI Awards Committee, and FHWA/Federal Lands Bridge Engineer, on winning entries in the 2003 ASBI Bridge Award of Excellence Competition. A strong convention technical program includes case studies of the Maumee River Bridge, Toledo, Ohio, and the Dallas High Five Interchange. The Tuesday afternoon bridge tour will be to the Dallas High Five Interchange.

Hyatt Regency, Dallas, TX

2003 ASBI Bridge Award of Excellence Competition

Judging of entries in the 2003 ASBI Bridge Award of Excellence Competition was held August 12 at the FHWA Eastern Federal Lands Conference Room in Sterling, Virginia. The Awards Jury included the following:

Shoukry Elnahal, Team Leader
FHWA Resource Center
Structures Technical Service Team

Robert J. Healy, Deputy Director
Office of Bridge Development
Maryland State Highway Administration

Malcolm T. Kerley, Chair
AASHTO Subcommittee on Bridges and Structures, and Chief Engineer for Program Development
Virginia Department of Transportation

James E. Roberts, Consultant
(Caltrans-retired)
Sacramento, California

Winning entrants will be announced in the October issue of ***Concrete Products Magazine***. Awards will be presented at the Monday, November 3 luncheon at the ASBI Convention.

2003 ASBI Seminar Newark, New Jersey

The 2003 ASBI Seminar on "Design and Construction of Segmental Concrete Bridges" was held July 21-22 at the Newark International Airport Marriott. Attendance was 88. Copies of the notebook distributed at the seminar may be obtained by completing the enclosed publication order form and returning it to the ASBI office.

HPC Bridge Views

Enclosed are copies of recent editions of *HPC Bridge Views* produced by the National Concrete Bridge Council (NCBC) under a cooperative agreement with the Federal Highway Administration.

ASBI Grouting Certification Training

ASBI Grouting Certification Training events were held March 3-4 in Berkeley, California, and June 16-17 in College Park, Maryland. The March training session was cosponsored by **Caltrans** and the June session was cosponsored by the Maryland State Highway Administration. Coincidentally, attendance at both of those sessions was 109, bringing total attendance to 604. **Table 1** summarizes the five training sessions held to date, as well as two sessions scheduled for 2004.

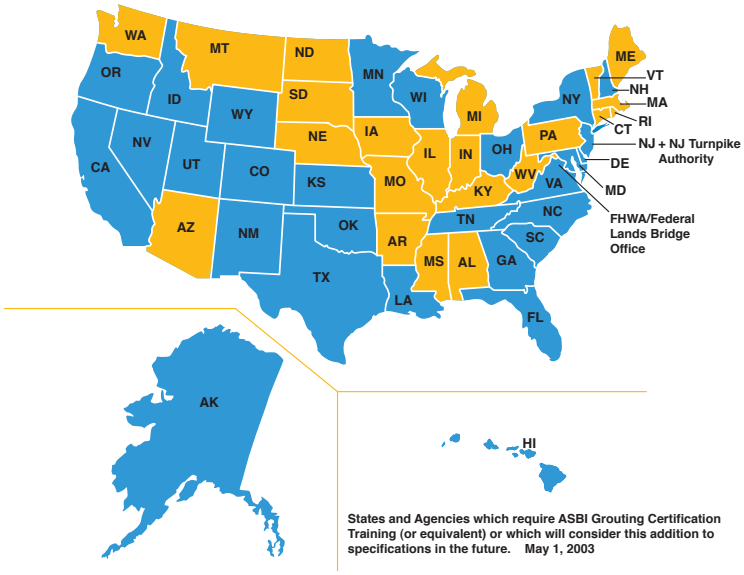
The States shaded in blue in the map at the right, either currently require grouting supervisors and inspectors to be ASBI Certified Grouting Technicians or to have equivalent training and experience, or will consider adding this requirement to specifications in the future. We are very pleased with the AASHTO response to date to our grouting certification training program.

Names of holders of Certified Grouting Technician Certificates, and Grouting Training Certificates are listed on the ASBI website: *www.asbi-assoc.org*.

TABLE 1.

Date	Location	Co-Sponsor	Attendance
8/6-8/2001	Austin, TX		140
1/14-16/2002	Austin, TX		85
6/24-26/2002	Tampa, FL	FL DOT	161
3/3-4/2003	San Francisco, CA	CA DOT	109
6/16-17/2003	College Park, MD	MD DOT	109
4/5-6/2004	Jacksonville, FL	FL DOT	
*2004	Austin, TX	TX DOT	

* Tentative



New ASBI PowerPoint CD available on "Segmental Concrete Rapid Transit and Rail Bridges"

A new ASBI PowerPoint CD is available on "Segmental Concrete Rapid Transit and Rail Bridges" featuring 106 slides of major segmental rapid transit projects in the U.S., France Bangkok, and Hong Kong. The projects illustrate the construction speed, and aesthetic advantages of segmental concrete rapid transit and rail bridges. The CD may be ordered by completing and returning the enclosed publications order form to the ASBI office.

This presentation was developed with the assistance of members of the American Segmental Bridge Institute who have collectively made substantial contributions to development of rapid transit projects in the United States, and in other countries. The following companies provided illustrative material used in this presentation.

Earth Tech
(formerly J. Muller International)
Tren Urbano; San Juan, Puerto Rico
RTP 2000; Vancouver, BC

Figg Engineering Group
MARTA; Atlanta, Georgia
WMATA; Suitland Parkway, Maryland
JFK Airport; New York, NY

International Bridge Technologies
Tren Urbano; San Juan, Puerto Rico
RTP 2000; Vancouver, BC

T.Y. Lin International
Los Angeles Green Line
Los Angeles, California

Parsons
RTA; Cleveland, Ohio
WMATA; Naylor Road Station and Line
Tri-Met Light Rail
Portland, Oregon

Parsons Brinckerhoff
RTA; Cleveland, Ohio
Tren Urbano; San Juan, Puerto Rico
Center Line LRT
Orange County, CA

VSL International
Bangkok Transit System, Thailand
Avignon TGV Viaducts, France
The West Rail Project, Hong Kong

San Francisco - Oakland East Bay Skyway Bridge, California

Segment casting is underway for the $1.047 billion San Francisco-Oakland East Bay Skyway Bridge at the **Kiewit/FCI**/Manson Joint Venture casting yard in Stockton, California. Segments weighing up to 800 tons will be transported from Stockton to the bridge site by water for erection starting in the spring of 2004. **Fig. 1** shows long-line casting bed 2F and gantry. A segment in casting bed 1 is shown in **Fig. 2**. An 800-ton segment transporter supplied by **Rizzani de Eccher/Deal** is shown in **Fig. 3**, and **Fig. 4** shows segments in storage.

An ASBI boat tour to the casting yard and the bridge site is being planned for late summer 2004.

Owner: **California DOT**
Designer: **T.Y. Lin International**
Contractor: **Kiewit/FCI**/Manson Joint Venture
Construction Engineer: **Parsons**
Post-Tensioning/SLED: **Schwager Davis, Inc.**

Figure 1 - Gantry at long-line casting bed 2F, San Francisco-Oakland Skyway Bridge

Figure 2 - Segment in casting bed 1, San Francisco-Oakland Skyway Bridge

Figure 3 - 800 ton capacity segment transporter, San Francisco-Oakland Skyway Bridge

Figure 4 - Segment storage, San Francisco-Oakland Skyway Bridge

Figure 5 - Architectural Rendering, Wakota Bridge, Minnesota

Wakota Bridges, South St. St. Paul, Minnesota

The Wakota Bridges (**Figs. 5 and 6**) are two parallel segmental concrete box girder bridges that will carry Interstate 494 over the Mississippi River in South St. Paul, Minnesota. These two bridges will replace the existing steel arch bridge which will be demolished after the westbound bridge is completed in 2005.

The bridges are 576 meters in length with a maximum span of 142 meters. Each bridge can accommodate five lanes of traffic and the westbound bridge also has a 3.6 meter wide trail on the north side.

The bridge widths are variable due to entrance and exit ramps at both ends of the bridges. The westbound bridge width varies from 37.3 meters at an abutment to 30.1 meters over most of the piers. The eastbound bridge width varies from 33.8 meters at an abutment to 26.2 meters over most of the piers. For aesthetic reasons, the exterior cantilever is constant which forced the interior cantilever to vary between a minimum of 2.1 meters to a maximum of 5.9 meters. The majority of the width variation is accommodated with a wider box section at the abutments.

The three spans over the Mississippi River will be cast in place using the balanced-cantilever method. Even though the bridge width is different, the shape of each of the boxes is similar so that the same forms can be utilized for both bridges. The end spans will be constructed on falsework over an active railroad and roadway.

The design of the Wakota Bridges was completed in August 2002 by **HNTB Corporation**. On December 20, 2002, the bridges were let as part of a larger contract which included 15 other bridges and major roadway construction. Lunda Construction and Kramer-McCrossan bid on the contract. Lunda Construction was awarded the project as the low-bidder. The cost of the two segmental bridges was approximately $58 million. Construction is currently underway and estimated to be completed in November 2007.

Figure 6 - Architectural Rendering, Wakota Bridge, Minnesota

Construction of Puerto Rico's First Cable-Stayed Bridge in Progress
San Juan, Puerto Rico

Bridge foundations are currently under construction on the PR-148 cable-stayed bridge in Puerto Rico. The **HNTB** designed bridge is the first cable-stayed bridge ever constructed in Puerto Rico. The bridge crosses the La Plata River 20 miles north of San Juan, between Naranjito and Toa Alta. Architectural renderings of the bridge are presented in **Figs. 7 and 8.**

HNTB's design of the PR-148 bridge was completed in 1997, but construction did not get under way until late 2002. The bridge features three spans of 320 meters with a center span of 160 meters. The approaches consist of precast, prestressed concrete girder spans with a typical length of 28 meters. The towers will be "A" shaped in a semi-harp arrangement, both for aesthetic reasons and to improve the wind performance of the bridge in this hurricane prone area. Construction of the A-frame towers will begin in June 2003. The bridge is expected to be completed in the summer of 2005.

The superstructure for the cable stayed span is a post-tensioned, cast-in-place edge girder floorbeam system. Floorbeams and cables are spaced at 6 meters.

Puerto Rico is an area of moderate to high seismic activity. The bridge was designed using an AASHTO response spectrum (Soil Profile Type I and an Acceleration Coefficient of 0.20g). All major bridge members were required to remain elastic for the design level earthquake and ductile detailing in accordance with AASHTO Seismic Performance Category C was provided in all potential plastic hinge regions.

HNTB prepared preliminary design, final design and contract documents for this concrete cable-stayed bridge. The final design was highly accelerated for this project with a schedule of less than 5 months.

Figure 7 - PR 148 Bridge, Puerto Rico

Figure 8 - PR 148 Bridge, Puerto Rico

Owner: Puerto Rico Highway and Transportation Authority
Designer: **HNTB Corporation**

Galveston Causeway Bridge Bids, Texas

Traylor Bros., Inc. recently submitted the low bid on the **Texas DOT** Galveston Causeway Bridge which incorporates cast-in-place balanced cantilever main spans. Bids submitted on the project were as follows:

Traylor Bros., Inc.
$135,933,272

Williams Bros. Construction
$145,519,531

J.D. Abrams
$149,671,909

Engineer Estimate
$134,000,000

Project Description: Construction of two each 8,592' long x 74' wide High Level Bridges on IH-45 on Galveston Bay over the Intracoastal Waterway. The bridge will connect the cities of Galveston, TX with Bayou Vista, TX.

The main CIP balanced cantilever span is 350' with 195' backspans and will have a vertical clearance of 73' from MH Water. The segment lengths are 15' and the box varies in height from 8' at the center closure segment to 19' at the Pier Table. There is approx 9,978 cy of Class H (HPC) concrete and approx 625,000 lbs of post-tensioning in the cantilever for both Northbound and Southbound Bridges.

The approach spans consist of 126,159 1f of TY VI (HPC) Prestressed Concrete Girders which are approx 135' in length.

Owner: **TX DOT**
Designer: **TX DOT**
Construction Engineering: Summit Engineering Group
Post-Tensioning Materials: **VSL**

Figure 10 - Casting operations, Lee Roy Selmon Crosstown Expressway expansion, Tampa, Florida

Figure 9 - Erection of first pier segment, Lee Roy Selmon Crosstown Expressway expansion, Tampa, Florida

Lee Roy Selmon Crosstown Expressway Expansion Tampa, Florida

Construction of the expansion of the Lee Roy Selmon Crosstown Expressway began earlier this year and is anticipated to be complete in 2005. The elevated structure located in the expressway median was designed by **FIGG** for the Tampa Hillsborough County Expressway Authority. **FIGG** is also providing construction engineering inspection. The contractor is PCL.

Casting operations are illustrated in **Fig. 9**. A total of 3,032 segments are required for the project. **Fig. 10** shows erection of the pier segment for the first 142' span on the span-by-span erection girders.

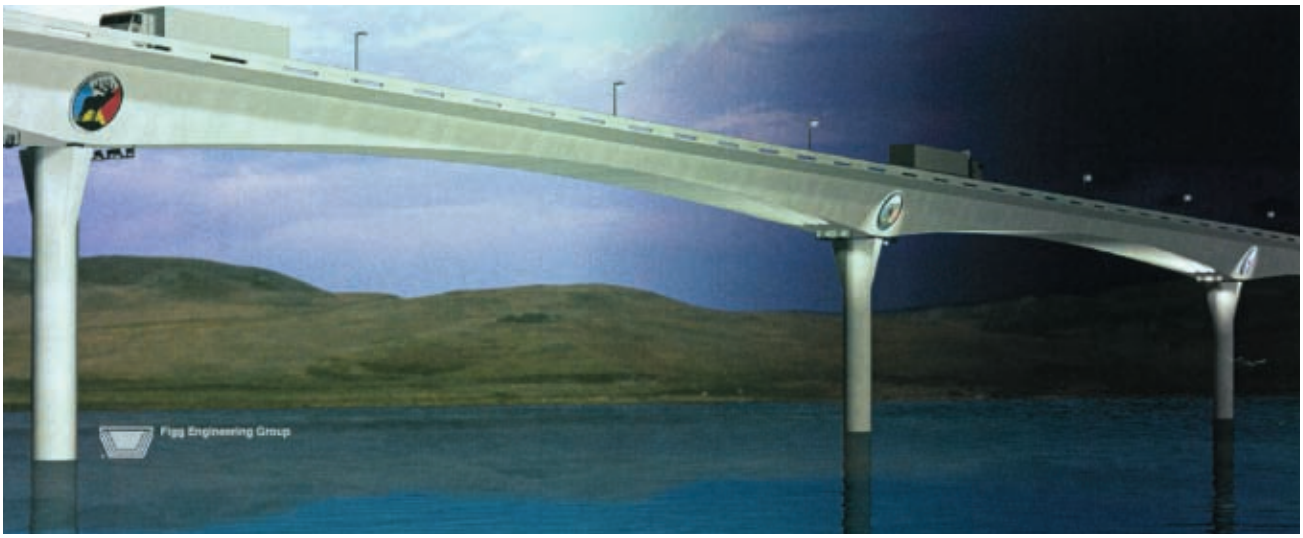


Figure 11 - Four Bears Bridge Rendering

Four Bears Bridge
New Town, North Dakota

Construction has begun on the Four Bears Bridge in New Town, North Dakota (**Fig. 11**). The bridge will be built for the North Dakota Department of Transportation and the Three Affiliated Tribes by **Fru-Con Construction**, who was the low bid in an alternate bid. The precast concrete segmental design, by **FIGG**, was low bid at $55,474,447. The bridge design includes 316' typical spans and thematic aesthetic elements developed with the Three Affiliated Tribes (Mandan, Arikara, and Hidatsa) who reside on the reservation adjoining Lake Sakakawea. The bridge will be complete in 2005, prior to a historic bicentennial celebration of the completion of the Lewis & Clark expedition. **FIGG** will also be providing construction engineering inspection services to North Dakota Department of Transportation. Pedestrian walkway elements (**Fig. 12**) include medallions reflective of the cultural history of the Three Affiliated Tribes and contain tributes to leaders, sacred animals, and historical events. The railing also includes silhouettes of sacred animals. The web walls of the superstructure, at each pier, show artwork reflecting the culture of the Three Affiliated Tribes, (**Fig. 13**).

Figure 13- Pedestrian walkway elements, Four Bears Bridge

Figure 12 - Superstructure artwork at piers, Four Bears Bridge

Figure. 14 - Ramp Construction, Maumee River Bridge, Toledo, Ohio

Maumee River Bridge Toledo, Ohio

Erection of segments for the first ramp structure of the Maumee River Crossing is proceeding without disruption of Interstate 280 traffic passing underneath (**Fig. 14**). The contractor, **Fru-Con Construction Corporation**, is using protective canopies attached to the segments to prevent debris from falling into the roadway. **FIGG** designed the bridge and is providing construction engineering inspection services for the Ohio Department of Transportation.

Figure 15 - Pier segments, New Victory Bridge, New Jersey

Victory Bridge New Jersey

Segment casting is underway for the New Victory Bridge in New Jersey by **Bayshore Concrete Products Corporation** in Cape Charles, Virginia. A view of the 90 ton pier segments is shown in **Fig. 15**, and the typical 69 ton segments are shown in **Fig. 16**.

Segments will be barged to New Jersey for erection in the New Victory Bridge. The bridge was designed by **FIGG** for the New Jersey Department of Transportation. **FIGG** is also providing construction engineering inspection services for the project.

Figure 16 - Typical segments, New Victory Bridge, New Jersey

Figure 17 - Memorial Causeway Bridge Construction, Clearwater, Florida

Memorial Causeway Bridge Clearwater, Florida

Construction views of the new Memorial Causeway Bridge in Clearwater, Florida are shown in **Figs. 17** and **18**.

The bridge is 2,540 ft. long with 74 ft. vertical clearance over the intracoastal waterway. The bridge carries two lanes of traffic in each direction with a sidewalk on each side.

The 360 ft. main span is centered over the channel, and is flanked by two 350 ft. spans. Approach span lengths vary to accommodate existing features, and to provide a gradual transition in span length towards the abutments. The three longer center channel spans have haunched box girder soffits, while the shorter approach spans are constant depth.

The overall width of each box girder is 54.75 feet, and a 2-foot wide longitudinal closure pour will complete the 110-foot wide deck. After completion of the railings and barriers, the overall bridge width will be about 112 feet. The depth of the structure is a constant 9.25 feet for the shorter approach spans and will vary from 9.25 feet at mid-span to 18.25 feet near the pier for the main spans.

Figure 18 - Memorial Causeway Bridge Construction, Clearwater, Florida

Owner: **Florida DOT**
Designer: **HDR Engineering, Inc./Earth Tech (formerly J. Muller International)**
Contractor: PCL Civil Constructors
Construction Engineering: **Parsons Brinckerhoff Construction Services**
Construction Engineering Inspection: **Parsons Brinckerhoff Construction Services**
Post-Tensioning Materials Supplier: **VSL**

I-95, I-295 & SR 9A South Jacksonville Interchange, Florida

Recent construction views of Jacksonville south interchange are presented in **Figs. 19** and **20**. The interchange includes a new connection to State road 9A; this is a major link to complete the I-295 S.R. 9A belt around Jacksonville, Florida. The interchange includes ten major bridges. Two 72" bulb-tee bridges 895' long, two AASHTO type III bridges 292 and 232 meters long, three bridges using the precast Florida U-Beams 180, 180, and 126 meters long and three fly over bridges which are precast segmental box girders.

The three fly over ramps utilize 3.2m high constant depth segments. Ramp 'G' is a single lane while ramps 'H' and 'I' are two lane bridges. The trapezoidal box girder height and shape are the same for all three ramps, with the cantilever wings and box narrowed for the one lane ramp 'G' bridge. Ramps 'I' and 'G' are continuous between abutments, with lengths of 783 and 613 meters respectively. Ramp 'H' has an expansion joint at pier 11 with an overall length of 1089 meters. The number of segments is as follows:

Abutment / Expansion	8
Split Pier segments	74
Typical Segments	741
Total	823

The span lengths vary from 41m end spans to 67m typical spans with a long span of 75.7m in the ramp I Bridge. The balanced cantilever erection method using ground based cranes is being used.

Figure 19 - South Jacksonville Interchange, Florida

Owner: **Florida DOT**
Designer: **Parsons**
Contractor: AMEC Civil, LLC
Specialty Engineer: LoBuono Engineering, Inc.
PT Supplier: **VSL**
Grout & Epoxy Supplier: **Sika**
Form Work: Aluma Systems
Concrete Supplier: Cemex & Tarmac
Construction Engineering & Inspection: **Parsons** and Jones, Edmunds & Associates Construction Engineering Services

Fig. 20 - South Jacksonville Interchange, Florida

Figure 21 - Dallas High Five Interchange Construction

Figure 22 - Dallas High Five Interchange Construction

US – 75/ I H - 635 Interchange Dallas, Texas

Construction views of segmental ramps in the Dallas High Five Interchange are presented in **Figs. 21** and **22.** The rubber-tired erection device shown in the figures was specifically built for this project by Rizzani de Eccher. There are 27 spans in the five precast segmental ramps. The longest span is 300ft. Segment erection is still expected to be underway during the November 4 ASBI Convention tour of the interchange.

Owner: **TX DOT Dallas District**
Ramp Redesign: **Parsons**
Contractor: Zachry Construction
Segmental Bridge Subcontractor: **Rizzani de Eccher**/Zachry Construction Joint Venture
Construction Inspection: **TX DOT Dallas District**

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