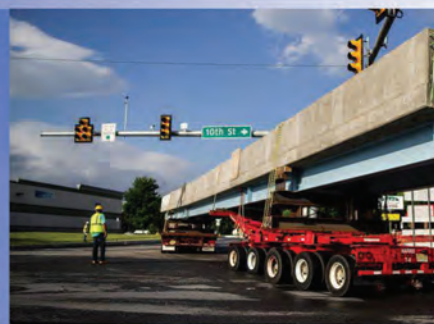




ACCELERATED BRIDGE CONSTRUCTION (ABC) UNIVERSITY TRANSPORTATION CENTER (UTC) 2015 HIGHLIGHTS







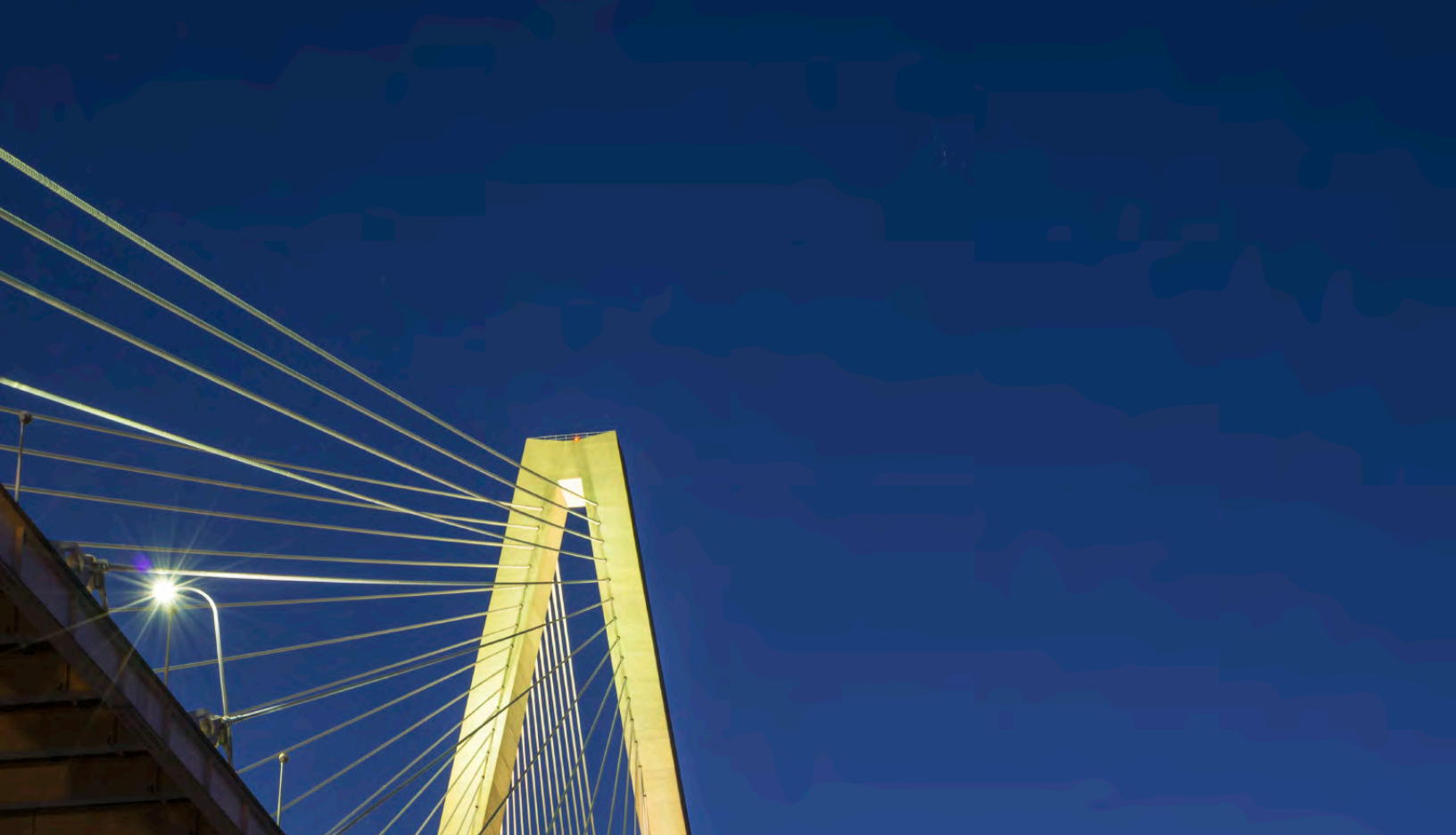
FLORIDA
INTERNATIONAL
UNIVERSITY

IOWA STATE
UNIVERSITY



University of Nevada, Reno





The mission of the ABC-UTC is to reduce the societal costs of bridge construction by reducing the duration of work zones, focusing special attention on preservation, service life, construction costs, education of the profession, and development of a next-generation workforce fully equipped with ABC knowledge.



LETTER FROM THE DIRECTOR



Dr. Atorod Azizinamini

Director of ABC-UTC

Professor and Chair, Civil and Environmental Engineering

Florida International University

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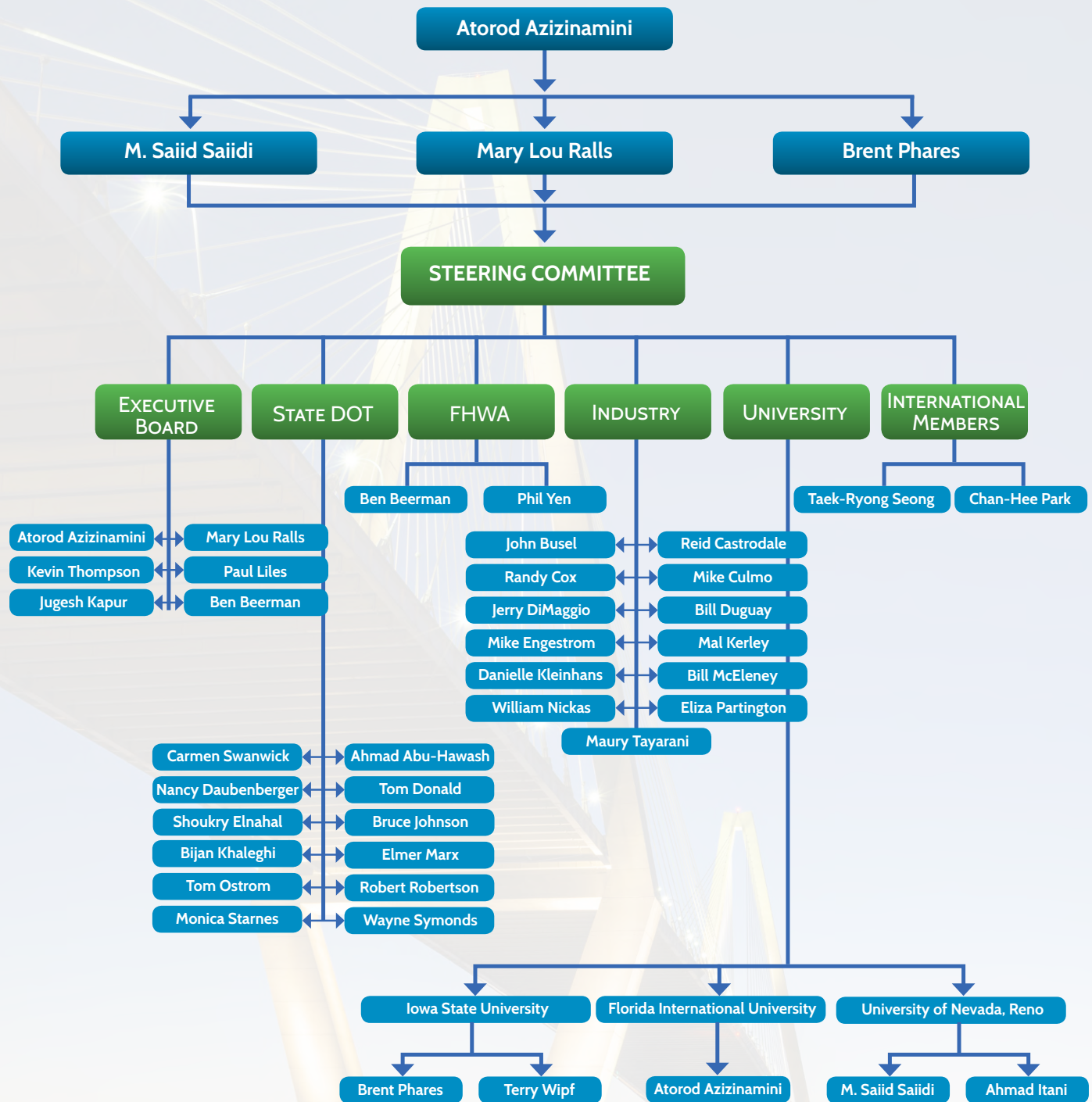
In September 2013, the U.S. DOT designated a consortium of universities led by Florida International University (FIU) to be the recipient of a Tier 1 University Transportation Center (ABC-UTC) with focus on ABC. In just two and half years, the ABC-UTC has embarked upon ABC-related research emphasizing state of good repair, undertaking various educational and workforce development activities, and expanding technology transfer activities.

The ABC-UTC consortium of universities – FIU, Iowa State University (ISU), and the University of Nevada, Reno (UNR) – is working in partnership with stakeholders to provide the schools' students and the profession with the best possible service. A distinct feature of the ABC-UTC is its close collaboration with AASHTO SCOBS members, FHWA, and the bridge profession. The first (2014) and second year cycle (2015) research projects at the ABC-UTC were selected, through collaborative discussions, as those best suited to fill knowledge gaps in the ABC area. The research products developed by the ABC-UTC, such as an ABC database, are providing the resources that bridge professionals are requesting. Consultants have joined the consortium in ABC-UTC activities, such as mentoring, to assist in the development of a more knowledgeable workforce capable of implementing new frontiers in ABC. Following the extremely successful 2014 National ABC Conference the ABC-UTC held its second National ABC Conference in December of 2015 that was attended by approximately 650 national and international bridge professionals. In November 2015, the ABC-UTC held its second in-depth web training sessions. In addition, during 2015 the ABC-UTC held 12 very popular monthly webinars. This second annual highlights report summarizes the ABC-UTC's efforts during its second year. The organization welcomes your thoughts and suggestions on how it might better support the bridge profession in the effective implementation of ABC across the U.S.

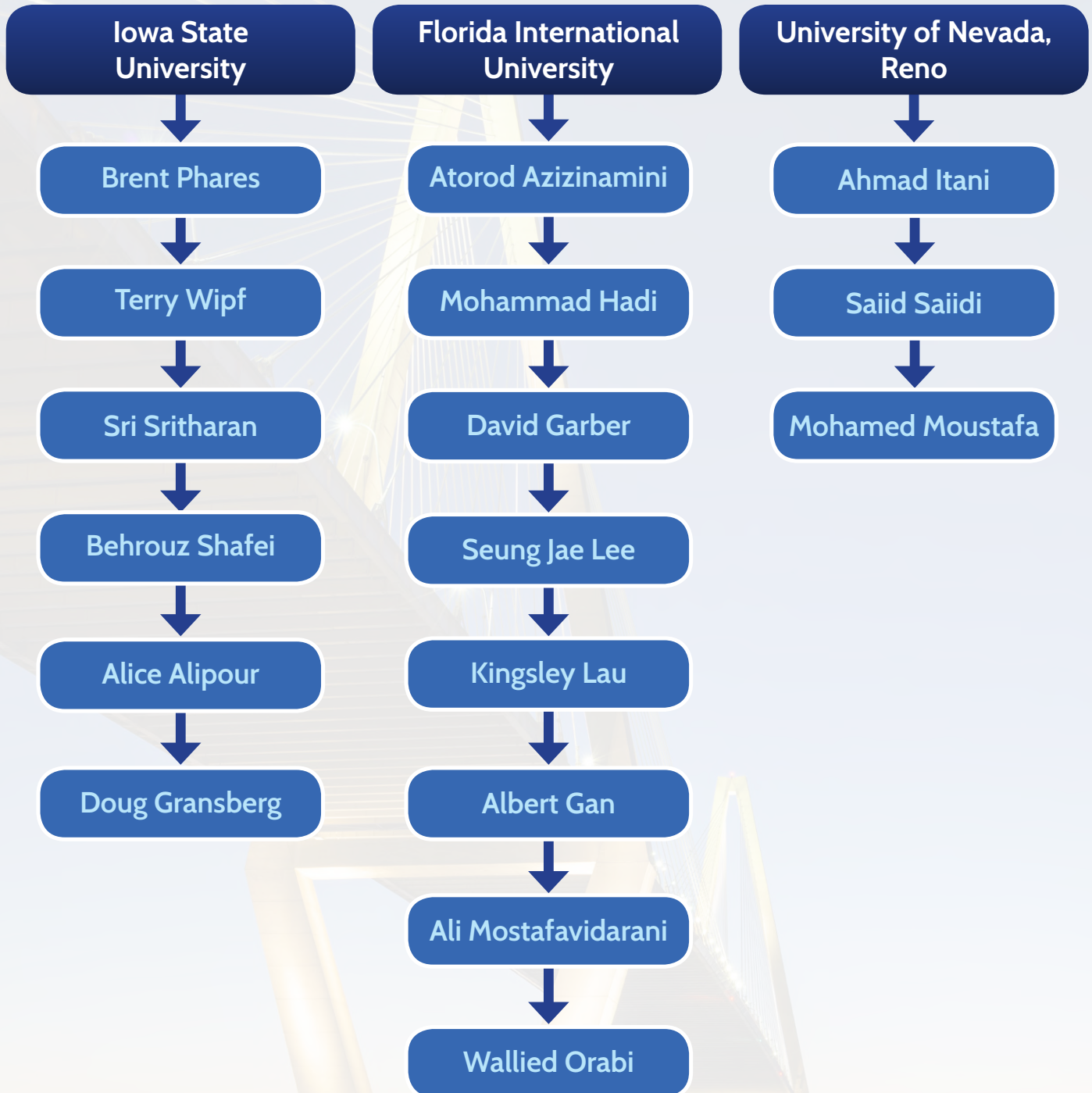
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ORGANIZATIONAL CHART



ORGANIZATIONAL CHART



LEADERSHIP: REFLECTIONS ON ACCOMPLISHMENTS



Atorod Azizinamini, Ph.D., P.E.

ABC-UTC Director

Professor and Chair, Department of Civil and Environmental Engineering,
College of Engineering and Computing,
Florida International University (FIU), Miami, Florida

The ABC-UTC at FIU had another banner year in 2015. Establishing the ABC-UTC by the U.S. DOT and allowing one of the Tier 1 UTCs to be devoted to ABC, has allowed the consortium members to serve the bridge community both locally and nationally. The FIU team initiated two new research projects and continued two of the first year cycle research projects to its Phase II. In two of the research projects, the FIU team is working very closely with ISU and UNR. The ABC-UTC team is also working closely with stakeholders to ensure that their work is beneficial and easy to implement. Through its webinars and other activities, the ABC-UTC is delivering the information and services needed to ensure the adoption of ABC as a norm.

The team organized the second National ABC Conference in December 2015. Highlights of the conference are available at <https://abc-utc.fiu.edu/conference/2015-national-accelerated-bridge-construction-conference/>. Eleven Ph.D. students are working on ABC-UTC research projects at FIU. The FIU team is also continuing to work closely with two undergraduate student interns (both of them belonging to minority groups). The team conducted its first summer camp during July 2015 and is planning another one for summer of 2016. FIU has reached out to practitioners, asking them to help ABC-UTC graduate students at FIU by becoming mentors. Locally, FIU is helping FDOT districts 4 and 6 in utilizing ABC technologies.

The ABC-UTC at FIU has become a focal point for ABC!



Brent Phares, Ph.D., P.E.

ABC-UTC Co-Director

Director, Bridge Engineering Center

Institute for Transportation

Iowa State University

Research Associate Professor

Department of Civil, Construction and Environmental Engineering

Iowa State University

Iowa State University has made several notable accomplishments during the second year of ABC-UTC activities. For example, the university's ABC-UTC partner has continued and grown the AASHTO RIDES outreach program in the State of Iowa that was started during the first year of ABC-UTC activities. In addition, working with a world-renowned group of ABC experts, ISU researchers completed two ABC-related projects. One of these projects developed and evaluated several connection details that could be used in ABC applications to create integral bridge abutments.

The developed details were targeted towards two different ABC approaches: Slide-in-Bridge Construction (SIBC) and Prefabricated Bridge Elements and Systems (PBES). The second project was a synthesis of accelerated bridge repair and rehabilitation methods. The results of that project indicated that there is a void in accelerated ways to repair bridge substructures.

LEADERSHIP: REFLECTIONS ON ACCOMPLISHMENTS



M. "Saiid" Saiidi, Ph.D., P.E.

ABC-UTC Co-Director
Professor
Department of Civil and Environmental Engineering
University of Nevada, Reno

The University of Nevada at Reno as part of the ABC-UTC embarked on three research projects, educated research assistants in ABC, and was involved in ABC technology transfer. The research projects, one funded completely by UTC and the other two co-funded with other sources, addressed innovative connections that could improve the seismic performance of precast bridge piers, integrated research on the seismic responses of mechanical couplers, and started the development of the seismic design of precast cap beams. The latter two projects were completed in August 2015; final reports have been prepared, reviewed by the steering committee and finalized. One Ph.D. student and a half-time post-doctoral fellow were involved in the research projects and were trained to prepare the next generation of skilled

labor in the seismic aspects of ABC. An undergraduate student was recruited in January 2015 to work on a research project, thus furthering workforce development. With respect to tech transfer, the UNR team developed a course module on ABC seismic design, organized several technical sessions at conferences on the earthquake engineering aspects of ABC, presented several ABC articles at conferences, and gave several presentations to AASHTO T-3 and the TRB Committee AFF50 on ABC seismic design considerations and on the activities of ABC-UTC.



Mary Lou Ralls, P.E.

ABC-UTC Director of Technology Transfer
Principal, Ralls Newman LLC, Austin, TX

In its second year, the ABC-UTC has continued and expanded technology transfer activities begun in 2014. The monthly webinar series featuring presentations on ABC projects and technologies has continued to draw hundreds of registered sites, many of them with multiple participants, resulting in thousands of participants each month. The ABC-UTC hosted its second in-depth web training session in November 2015 and expanded its website with research, education, and technology transfer information. Working with FHWA, the ABC-UTC posted the National ABC Project Database on the ABC-UTC website and enhanced its functionality to include a submission process for the addition of new projects. Faculty and staff members of the ABC-UTC continued collaboration with the AASHTO Subcommittee on Bridges and Structures, attending the 2015 Annual Meeting and giving presentations on ABC-UTC activities to several of its technical committees. ABC-UTC representatives also participated in other national and regional bridge meetings to spread the word about the ABC-UTC and its activities. The ABC-UTC hosted its second National ABC Conference in December 2015 in Miami, Florida.

STEERING COMMITTEE

PARTNER UNIVERSITIES

Atorod Azizinamini, Florida International University
Saiid Saiidi, University of Nevada, Reno
Brent Phares, Iowa State University
Ahmad Itani, University of Nevada, Reno
Terry Wipf, Iowa State University

ABC-UTC EXECUTIVE BOARD

Atorod Azizinamini, Florida International University
Mary Lou Ralls, Ralls Newman, LLC; former State Bridge Engineer, Texas
Kevin Thompson, California High Speed Rail Authority; former State Bridge Engineer, California
Jugesh Kapur, Burns & McDonnell; former State Bridge Engineer, Washington State
Paul Liles, former State Bridge Engineer, Georgia
Ben Beerman, Federal Highway Administration

STATE DEPARTMENTS OF TRANSPORTATION AND STATE AGENCIES

Carmen Swanwick, AASHTO SCOBS T-4 Chair, Utah DOT
Wayne Symonds, AASHTO SCOBS T-4 Vice-Chair, Vermont Agency of Transportation
Ahmad Abu-Hawash, Iowa DOT
Nancy Daubenberger, Minnesota DOT
Tom Donald, Massachusetts DOT
Shoukry Elnahal, Delaware River & Bay Authority
Bruce Johnson, Oregon DOT
Bijan Khaleghi, Washington State DOT
Elmer Marx, Alaska DOT&PF
Tom Ostrom, California DOT
Robert Robertson, Florida DOT
Monica Starnes, Transportation Research Board

FEDERAL HIGHWAY ADMINISTRATION

Ben Beerman, Resource Center
Phil Yen, Office of Infrastructure

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Chan-Hee Park, RIST, South Korea

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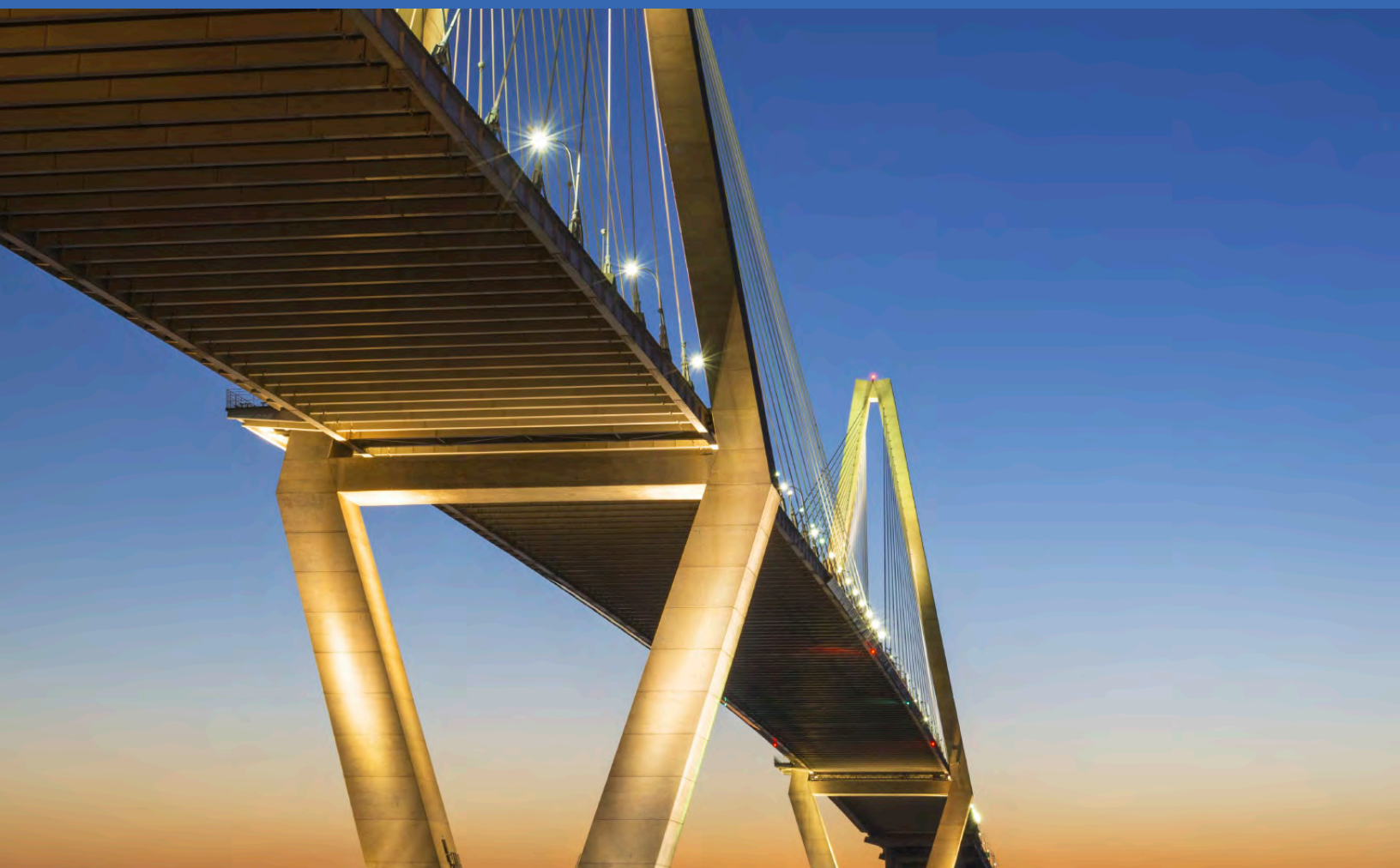
John Busel, American Composites Manufacturers Association (ACMA)
Reid Castrodale, Lightweight concrete rep.
Randy Cox, American Segmental Bridge Institute (ASBI)
Mike Culmo, CME Associates, Inc.
Jerry DiMaggio, Applied Research Associates, Inc.
Bill Duguay, Associated General Contractors of America (AGC), rep.; J.D. Abrams, LP
Mal Kerley, NXL Construction Services, Inc.
Danielle Kleinhans, National Concrete Bridge Council (NCBC), rep.
Bill McEleney, National Steel Bridge Alliance (NSBA)
William Nickas, Precast/Prestressed Concrete Institute (PCI)
Eliza Partington, FIGG
Maury Tayarani, Pennoni Associates Inc.

FLORIDA INTERNATIONAL UNIVERSITY FACULTY

Hesham Ali, Professor of Practice
Atorod Azizinamini, Professor and Chair
Fabian Cevallos, Transit Program Director
Albert Gan, Professor
David Garber, Assistant Professor
Mohammad Hadi, Associate Professor
Xia Jin, Assistant Professor
Kingsley Lau, Assistant Professor
Seung Jae Lee, Assistant Professor
Ali Mostafavidarani, Assistant Professor
Wallied Orabi, Assistant Professor
Yan Xiao, Research Associate



ABC-UTC RESEARCH



COMPILATION OF ABC SOLUTIONS

PI: David Garber

Co-PI: Jawad Gull

Student Research Assistant: Mohamadreza Shafieifar

Start Date: 2014



Objective:

Compile information on completed ABC projects and present the information in a manner useful to designers and other bridge professionals. This project expands and enhances the existing FHWA ABC projects database.

Deliverables:

Comprehensive ABC projects database that is user-friendly and searchable

Research Advisory Panel

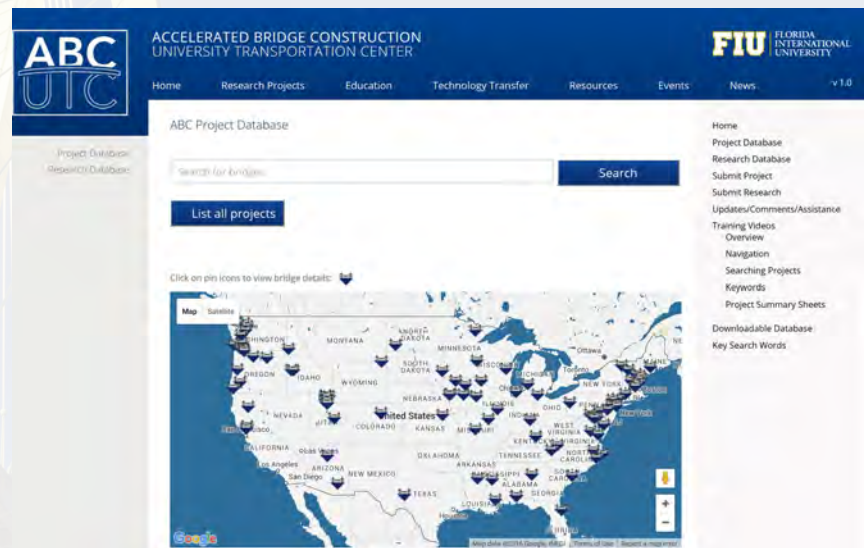
(ABC Projects Database

Steering Committee):

Nancy Daubenberger, Minnesota DOT;
Thomas Donald, Massachusetts DOT;
Bijan Khaleghi, Washington State DOT;
Paul Liles, formerly Georgia DOT; Elmer Marx, Alaska DOT&PF; Tom Ostrom, Caltrans; Carmen Swanwick, Utah DOT; Mike Culmo, CME Associates, Inc.; Ben Beerman, FHWA; Atorod Azizinamini, FIU; Mary Lou Ralls, FIU Steering Committee Chair

Status:

Completed 2015; draft final report issued.



IMPACT:

"The sharing of information is a critical aspect of the deployment of new technologies. Through this database, owners and designers can build on past successful projects leading to continuous improvement in the technology."

– Carmen Swanwick, Chief Structural Engineer, Utah DOT

INTERNATIONAL DATABASE OF ABC RESEARCH

PI: David Garber

Student Research Assistant: Nazanin Rezaei

Start Date: 2014



Objective:

Compile published and unpublished information on completed and ongoing ABC research and present the information in a manner useful to designers and other bridge professionals.

Deliverables:

Comprehensive ABC research database that is user-friendly and searchable

Research Advisory Panel:

Nancy Daubenberger, Minnesota DOT;
Thomas Donald, Massachusetts DOT; Bijan Khaleghi, Washington State DOT; Paul Liles, formerly Georgia DOT; Elmer Marx, Alaska DOT&PF; Tom Ostrom, Caltrans; Carmen Swanwick, Utah DOT; Mike Culmo, CME Associates, Inc.; Ben Beerman, FHWA; Atorod Azizinamini, FIU; Mary Lou Ralls, FIU

Status:

The framework of the research database has been created; the front-end user-interface is in development.



IMPACT:

"This is an excellent source of information for ABC users who want to learn how ABC projects are done and who want to keep up with the latest technologies that are being used on these projects."

– Paul Liles, former State Bridge Engineer, Georgia DOT

ESTIMATING TOTAL COST OF BRIDGE CONSTRUCTION USING ABC AND CONVENTIONAL METHODS OF CONSTRUCTION

PI: Mohammed Hadi

Co-PIs: Ali Mostafavidarani, Wallied Orabi, Yan Xiao

Student Research Assistants: Mohamed Ibrahim, Jianmin Jia

Start Date: 2014



Objective:

Develop a framework that estimates the total cost of bridge construction and incorporates other tools, methods, and processes to support ABC decision making. Data and modeling analysis of the construction, agency, and user costs involved in ABC bridge construction will be used. Data from several ABC case studies will be used for documentation and analysis of costs. The data will then be analyzed to develop robust models for cost estimation and decision-making.

Deliverables:

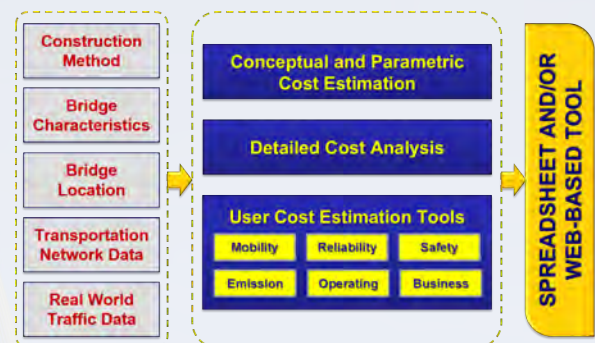
Cost-estimation and decision-making framework for comparison of ABC versus conventional bridge construction

Research Advisory Panel:

Ben Beerman, FHWA; Bill Dreher, Wisconsin DOT; Kristin Higgins, Vermont Agency of Transportation; Bruce Johnson, Oregon DOT; Mary Lou Ralls, FIU

Status:

A square foot construction cost estimation tool has been developed. Analysis of several ABC case studies to develop detailed cost estimates is ongoing. Procedures and tools to estimate mobility, reliability, emissions, vehicle operating cost, and safety have been integrated into a single spreadsheet-based tool for user cost estimation at different construction stages. The multi-level road user cost environment is currently being extended by integrating dynamic traffic assignment/simulation-based analysis tools and also methods to estimate the impacts of bridge construction on local businesses and freight commodity.



IMPACT:

“As with all new initiatives, the cost....or the unknown or uncertainty of the cost....is the major reason that impacts acceptance. While ABC construction provides an obvious benefit to the traveling public, the ability to estimate the total project costs of a project, using both ABC and traditional construction methods, will provide bridge owners with the ability to make the best possible decisions in developing their projects. This effort will give bridge engineers a resource to help answer the question...‘How much will it cost?’”

– Malcolm T. Kerley, P.E., President NXL Construction Services, Inc.

EXTENDING APPLICATION OF SIMPLE FOR DEAD AND CONTINUOUS FOR LIVE LOAD STEEL BRIDGE SYSTEM TO ABC APPLICATIONS IN SEISMIC REGIONS– PHASE I– NUMERICAL STUDY

PI: Atorod Azizinamini

Student Research Assistant: Ramin Taghinezhad

Start Date: 2014



Objective:

Examine available research data generated over the past decade and conduct numerical analyses to extend the application of the simple for dead and continuous for live load (SDCL) steel bridge system to ABC applications in high seismic areas. A subsequent Phase II project will experimentally test the recommendations from this Phase I project.

Deliverables:

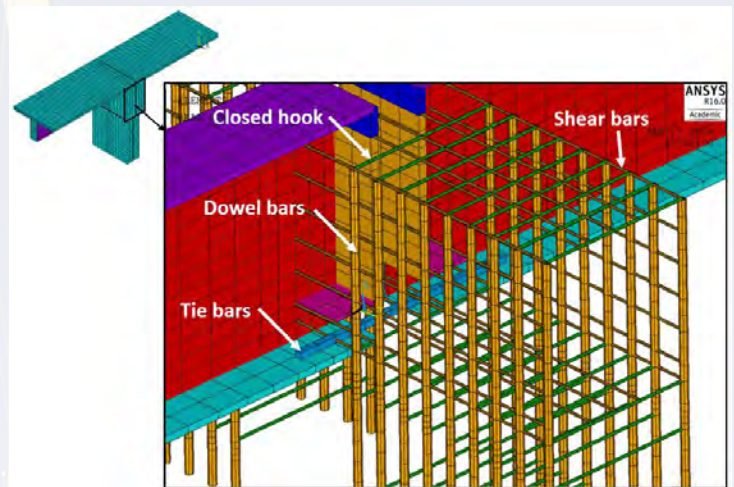
Recommended details and design provisions to extend the application of the SDCL steel bridge system to ABC applications in high seismic regions, ready for experimental testing in Phase II

Research Advisory Panel:

Bruce Johnson, Oregon DOT; Bijan Khaleghi, Washington State DOT; Elmer Marx, Alaska DOT&PF; Tom Ostrom, Caltrans

Status:

A detail suitable for extending the application of SDCL to seismic regions has been developed. The figure below shows the detail that consists of the addition of dowel bars and tie bars in the concrete diaphragm.



IMPACT:

“Our State DOT has used the ‘Simple for Dead and Continuous for Live’ concept for many years in precast concrete girder designs and in a few cases for steel girder designs, where it provided significant advantages in durability, due to removal of deck joints, and in design efficiency. We are very interested to see this concept extended to ABC applications, due to its inherent advantages.”

– Bruce Johnson, State Bridge Engineer, Oregon DOT

DEVELOPMENT OF MANUAL FOR ENHANCED SERVICE LIFE OF ABC PROJECTS



PI: Atorod Azizinamini

Co-PI: Jawad Gull

Student Research Assistant: Azadeh Jaberri & Morgan Dickenson

Start Date: 2014

Objective:

Identify factors that impact service life of ABC projects and develop strategies to mitigate those factors. Incorporate case studies, examples, design, inspection and maintenance information. Develop the manual to be flexible and accommodating to the addition of new information as it becomes available.

Deliverables:

Manual on service life performance of ABC projects, with tools to assist the user to navigate through the information, in a general framework similar to the SHRP2 R19A Design Guide for Bridges for Service Life

Research Advisory Panel:

Mike Culmo, CME Associates, Inc.; Bruce Johnson, Oregon DOT

Status:

The current work concentrates on developing a complete array of reinforcement for closure pours.



IMPACT:

"This work can help to answer the second most asked question about ABC: Is it durable?"

– Michael P. Culmo, Vice President of Transportation and Structures, CME Associates, Inc.

FIU FACULTY & RESEARCH ASSOCIATE DIRECTORY



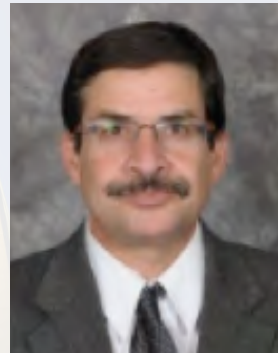
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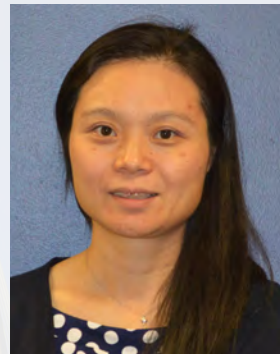
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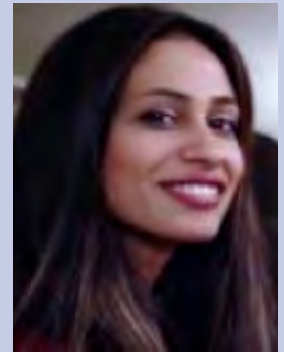
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FIU GRADUATE STUDENT RESEARCH ASSISTANTS



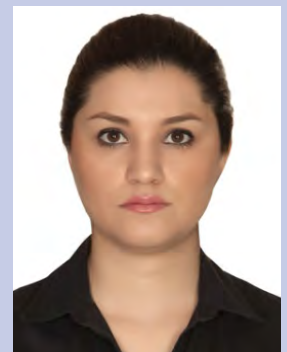
Morgan Dickenson is a graduate research assistant at FIU. He has over 36 years of experience providing construction material testing, construction engineering and inspection, engineering management, geotechnical engineering, and threshold building inspection services. He is a Professional Engineer in both Florida and Colorado. He has worked on numerous bridge, roadway and airport projects, including the Fort Lauderdale-Hollywood International Airport Runway Expansion project that features a bridge supporting the runway over a US Highway.

Mahsa Farzad is a graduate research assistant at FIU. She received her M.Sc. in Civil Engineering from Sharif University of Technology in Iran in 2013, and her B.S. in Civil Engineering in 2010 from Shahrood University of Technology in Iran. In her Master's thesis, she worked on an experimental study of building bracing systems using semi-rigid connections. She started her Ph.D. in Structural Engineering in 2014. Currently, she is working on the ABC-UTC "Extending Application of SDCL to ABC (Phase I – Conceptual and Analytical)" research project.

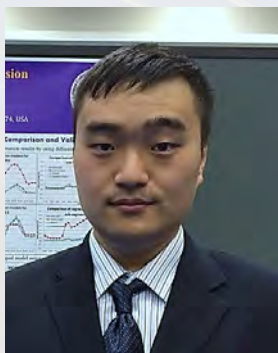


Mohamed Ibrahim is a Ph.D. candidate of Construction at FIU. He received his M.Sc. from Cairo University, Egypt, and his B.Sc. degree and an MBA degree from the American University in Cairo, Egypt. Mohamed has more than 10 years of working experience both as site engineer and an engineer consultant in Egypt and the Middle East. He started his Ph.D. degree in 2012. He is currently working on the ABC-UTC "Estimating Total Cost of Bridge Construction using ABC and Conventional Methods of Construction" research project.

Azadeh Jaber Jahromi is a Ph.D. candidate in Structures at FIU. She received her B.S. in 2006 from Tabriz University, Tabriz, Iran and her M.Sc. from Iran University of Science, Tehran, Iran. Her M.Sc. research focused on retrofitting concrete bridges with FPR and characterization of plastic hinges in reinforced concrete bridge piers. She was a structural designer at Mapna Group for seven years before returning to academia. She is currently working on the ABC-UTC "Development of Manual for Enhanced Service Life of ABC Projects" research project.

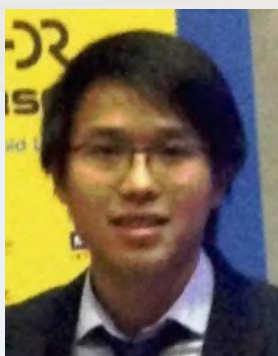
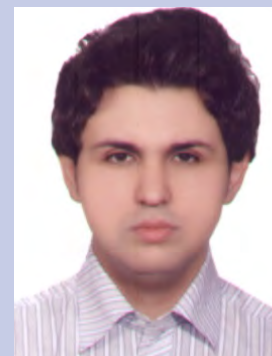


FIU GRADUATE STUDENT RESEARCH ASSISTANTS



Jianmin Jia is a Ph.D. candidate in the Transportation Engineering program at FIU since 2013. He received his M.S. degree in Civil Engineering in 2013, and his B.S. degree in Mathematics in 2010, both from Shandong University, Jinan, China. In his master's thesis, he worked on Integrated Evaluation System for Urban Green Transportation. Currently, he is working on the ABC-UTC "Estimating Total Cost of Bridge Construction using ABC and Conventional Methods of Construction" research project.

Alireza Mohammadi is a Ph.D. candidate in Structures at FIU since 2012. He received his B.S. in 2006 from Tabriz University, Tabriz, Iran and his M.Sc. from Sharif University, Tehran, Iran. He was a structural engineer at Zelzeleh Mohaseb Consulting Engineering Co. for four years before returning to academia. He has been involved in several bridge engineering research projects at FIU and assists with ABC-UTC research and other activities. His Ph.D. dissertation focuses on the dynamic response of high-rise building under wind excitation.



Huy V. Pham is a Ph.D. candidate at FIU since 2013. He received his B.S. and M.S. in Civil Engineering from the Georgia Institute of Technology. His doctoral research focuses on redundancy evaluation of twin steel box-girder bridges assuming one tension member of one box-girder is fractured. If redundant, the system will not require intensive hands-on inspection. Huy expects to complete his Ph.D. study in May 2016. He is also a co-founder of the Vietnamese Student Association organization and acts as the organization representative.

Nazanin Rezaei is a graduate research assistant at FIU. She received her M.Sc. degree from Iran University of Science and Technology in Tehran, Iran in 2012 and her B.S. degree in civil engineering from Arak University in Arak, Iran in 2009. She also worked as the head of Structural Department at E-lood Consulting Engineers in Tehran, Iran for three years. Currently, she is working on the effect of carbon nano tubes on concrete and is also involved in an ABC-UTC research project to compile all ongoing and completed ABC research.



FIU GRADUATE STUDENT RESEARCH ASSISTANTS



Mohamadreza Shafieifar is a Ph.D. candidate at FIU. He graduated from Sharif University, Iran, in 2012 with a M.S. in Civil Engineering. He is working on modeling buildings and bridges using Abaqus and SAP software. He has worked as a lecturer at the A.B.A. Institute of Higher Education in Iran and has also been a building designer at Bandab and Yekom consulting engineering firms in Iran. He is actively involved in ongoing research in the area of ABC. He has also taken an interest in new technologies such as web designing as one of his main hobbies.

Ramin Taghinezhad is a Ph.D. candidate at FIU. He received his B.S. degree in civil engineering and M.Sc. in structures. His experience includes performance based design, and design of commercial, residential and industrial steel and concrete structures. He has published more than 20 papers and a book entitled “Seismic Design and Rehabilitation of Structures under Pushover Analysis”. His current research is extending the application of the simple for dead load and continuous for live load steel bridge system in seismic regions.



Alireza Valikhani is a Ph.D. candidate at FIU. He holds a M.S. in the field of Structures from the University at Buffalo in New York, a M.S. in the field of Earthquake Engineering from Sharif University in Tehran, Iran and a M.S. in Civil-Environmental Engineering from Tehran University in Tehran, Iran. He holds a Bachelor in Civil Engineering from Tabriz University in Tabriz, Iran. In Sharif University and Buffalo he has conducted seismic research.

FIU UNDERGRADUATE RESEARCH INTERNS

FIU has an undergraduate research internship program to promote the involvement of undergraduate students in the ABC-UTC. The internships are used to attract undergraduate students to transportation-related employment. In 2015 FIU employed two undergraduate interns. Qualified students are recruited to work on ABC-UTC research projects.



Julian Gomez was an undergraduate research assistant at FIU during 2015. He completed his B.S. in Civil Engineering and is looking forward to pursuing a M.S. in Structural Engineering. Julian worked with the ABC-UTC at FIU for nearly a year as an undergraduate assisting with several different event projects and research. Outside of school, Julian loves to spend time with family and play soccer in his free time.

Joselaine Pateau is an undergraduate at FIU. She earned her Associate in Arts in Civil Engineering at Miami-Dade College. She is working towards a B.S. in Civil Engineering. Currently, she is working as a research intern for the ABC-UTC at FIU. The purpose of the research is to begin the process of developing crash-tested prefabricated bridge railings that have durable anchorage details. Joselaine is a member of Chi Epsilon and expects to graduate in the summer of 2016.



DEVELOPMENT OF PREFABRICATED BRIDGE RAILINGS

PI: Terry Wipf

Co-PIs: Sri Sritharan, Brent Phares

Student Research Assistant: Ashley Ecklund

Start Date: 2014

IOWA STATE UNIVERSITY
Institute for Transportation

Objective:

Develop crash-tested, prefabricated bridge railings with durable anchorage details. The two-step process will consist of Phase 1, the development and laboratory testing of prototype concepts, and Phase 2, full-scale crash-testing of promising concepts. This project is restricted to Phase 1.

Deliverables:

Laboratory-tested design details for F-shape prefabricated bridge rails with two barrier connection systems

Research Advisory Panel:

Ahmad Abu-Hawash, Iowa DOT; Dean Bierwagen, Iowa DOT; Mike Culmo, CME Associates, Inc.; Tim Fields, Connecticut DOT; and Kevin Goeden, South Dakota DOT

Status:

An F-shape profile was chosen and two barrier connection systems were designed for Test Level 4. Quasi-static laboratory testing will be conducted in early 2016, and final report will be submitted in 2016.



IMPACT:

"A prefabricated bridge railing system will be a great addition to the ABC tool box."

– Ahmad Abu-Hawash, Chief Structural Engineer, Iowa DOT

STRENGTH, DURABILITY, AND APPLICATION OF GROUTED COUPLERS FOR INTEGRAL ABUTMENTS IN ABC PROJECTS

PI: Travis Hosteng

Co-PIs: Lowell Greimann, Brent Phares

Student Research Assistant: Samuel Redd

Start Date: 2014

IOWA STATE UNIVERSITY

Institute for Transportation

Objective:

Develop integral abutment designs that incorporate grouted couplers and other innovative connection details that increase efficiency, economy, and long-term performance of bridges constructed using ABC techniques. Evaluate constructability, strength, and durability performance of the most promising design(s) in laboratory tests.

Deliverables:

Design details for laboratory-tested integral abutment with grouted coupler connections for ABC projects

Research Advisory Panel:

Ahmad Abu-Hawash, Iowa DOT; Elmer Marx, Alaska DOT&PF; and Mike Nop, Iowa DOT

Status:

Completed 2015; draft final report issued.



IMPACT:

"Integral abutment bridges are our first choice but often the precast elements are large, creating challenges in shipping and handling. This research has the potential to provide durable details that will allow us to use smaller pieces and improve constructibility of ABC integral abutment bridges."

– Wayne Symonds, Structures Program Manager, Vermont Agency of Transportation

SYNTHESIS ON RAPID BRIDGE REHABILITATION

PI: Brent Phares

Student Research Assistant: Meghan Cronin

Start Date: 2014

IOWA STATE UNIVERSITY

Institute for Transportation

Objective:

Synthesis of rehabilitation alternatives and solutions for rapid rehabilitation projects. Some of these alternatives will be adaptations of new construction methods; others will be strictly for rehabilitation activities.

Deliverables:

Comprehensive summary of available rapid rehabilitation solutions including design and construction procedures where appropriate

Research Advisory Panel:

Ahmad Abu-Hawash, Iowa DOT; Ben Beerman, FHWA

Status:

Completed 2015; draft final report issued. The results of this project indicated that there is a void in accelerated ways to repair bridge substructures.



Hydrodemolition

IMPACT:

"In the 1950's, the interstate was born with the Federal Aid Highway Act of 1956; we are now 60 years past. The bridge structures are beginning to crumble, and limited funding is available to replace them. We need to have a comprehensive program, tools, and techniques to rehabilitate from the ground up in a timely manner (get in, get out, and stay out) so they can last past another 60 years. This would reduce traffic, initial, and user's cost and help the economy of the United States, which is totally dependent on our transportation modes."

– Maury Tayarani, Project Manager, Massachusetts DOT

ISU FACULTY & RESEARCH ASSOCIATE DIRECTORY



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ISU GRADUATE STUDENT RESEARCH ASSISTANTS



Meghan Cronin received her M.Sc. degree with emphasis in structural engineering from Iowa State University in December 2015. She worked on ISU's ABC-UTC project, "Synthesis of Rapid Bridge Rehabilitation," in the Department of Civil, Construction and Environmental Engineering. She earned her B.S. degree in Civil Engineering from ISU in May 2014. Following graduate school, Meghan accepted an

engineering position with Meyer Borgman Johnson (MBJ) in Minneapolis, Minnesota. She is working in the aviation group at MBJ, specifically focusing on new and renovation work at several regional airports.



Ashley Ecklund received her B.S. in Civil Engineering from ISU in 2013 and is working towards receiving her M.S. in structural engineering. She is a research assistant on the ABC-UTC "Development of Prefabricated Bridge Railings" research project in the

Bridge Engineering Center at ISU. The purpose of the research is to begin the process of developing crash-tested prefabricated bridge railings that have durable anchorage details. Ashley will graduate in 2016.



Samuel Redd received his M.Sc. degree with emphasis in structural engineering from ISU in December 2015. He worked on ISU's ABC-UTC project, "Strength, Durability, and Application of Grouted Couplers for Integral Abutments in ABC Projects," in

the Department of Civil, Construction and Environmental Engineering. Samuel holds a B.S. cum laude in Construction Engineering from ISU. As an undergraduate he worked at the Bridge Engineering Center at ISU for over a year helping conduct research. Following graduate school, Samuel started working for Felsburg, Holt and Ullevig in Denver, Colorado as a bridge engineer.

DEVELOPMENT AND SEISMIC EVALUATION OF PIER SYSTEMS WITH POCKET CONNECTIONS AND UHPC COLUMNS

PI: M. Saiid Saiidi

Co-PI: Ahmad Itani

Student Research Assistant: Alireza Mohebbi

Start Date: 2014



University of Nevada, Reno

Objective:

Develop and evaluate resilient bridge piers consisting of prefabricated columns and cap beams subjected to simulated earthquake loading on shake tables. Focus on precast columns that are post-tensioned (PT) with unbonded carbon-fiber-reinforced polymer (CFRP) tendons and are connected to footings and cap beam using pocket connections. Specifically, determine: seismic performance of pocket connections with unbonded PT columns; seismic performance of square precast PT columns; effectiveness of CFRP tendons in minimizing residual displacements under strong earthquakes; performance of two different ultra-high performance concretes (UHPC) used in plastic hinges of columns; and design considerations and methods for connections, CFRP PT columns, precast square columns, and plastic hinges with UHPC.

Deliverables:

Details of design, construction process, and testing of the pier models; experimental data on all transducers for different levels of earthquakes; pretest and post-test analytical procedures and results; interpretation of the effect of different parameters that will be investigated through the experimental and analytical studies; practical design procedures and illustrative design examples; and final project report including details of the study and an executive summary

Research Advisory Panel:

Bijan Khaleghi, Washington State DOT; Elmer Marx, Alaska DOT&PF; Tom Ostrom, Caltrans

Status:

Construction of the two-column bent model will be completed in March 2016 and the pier is scheduled for testing on a shake table at UNR in April 2016.



Single column being placed on footing pocket connection

IMPACT:

"Combining prefabricated bridge elements with high performance materials will produce resilient bridge substructure components that are rapidly constructed and will provide enhanced seismic performance and post event serviceability."

– Tom Ostrom, Acting State Bridge Engineer, Caltrans

EVALUATION OF SEISMIC PERFORMANCE OF BRIDGE COLUMNS WITH COUPLERS AND DEVELOPMENT OF DESIGN GUIDELINES

PI: M. Saiid Saiidi

Co-PI: Ahmad Itani

Student Research Assistants: Kshitij C. Shrestha, Mostafa Tazarv

Start Date: 2014



University of Nevada, Reno

Objective:

Compile and interpret data on the seismic performance of different types of couplers in bridge columns, and establish characteristic plastic hinge behavior for different coupler types.

Deliverables:

Proposed preliminary design guidelines in AASHTO LRFD format for prefabricated columns with coupler connections for seismic regions, including methods for estimating plastic hinge length and rotational capacity

Research Advisory Panel:

Ahmad Abu-Hawash, Iowa DOT; Bijan Khaleghi, Washington State DOT; Elmer Marx, Alaska DOT&PF; Tom Ostrom, Caltrans

Status:

Completed 2015. The final report was reviewed by the Research Advisory Panel, comments were addressed, and the report was finalized and posted.



Headed bar couplers for precast column-footing connection

IMPACT:

“Quantifying the effects of mechanical couplers in the plastic hinge region will greatly advance the acceptance of ABC in high seismic regions.”

– Elmer E. Marx, Senior Bridge Engineer, Alaska Department of Transportation and Public Facilities

BEHAVIOR AND DESIGN OF PRECAST BRIDGE CAP BEAMS WITH POCKET CONNECTIONS

PI: M. Saiid Saiidi

Co-PI: Ahmad Itani

Student Research Assistant: Mostafa Tazarv

Start Date: 2014



University of Nevada, Reno

Objective:

Compile and interpret data on the seismic performance of cap beams with various pocket connection types and identify the behavior, design, detailing, and construction considerations important to the successful implementation of this category of connections. The study utilized data from NCHRP 12-74 and several other more recent studies to accomplish its objectives.

Deliverables:

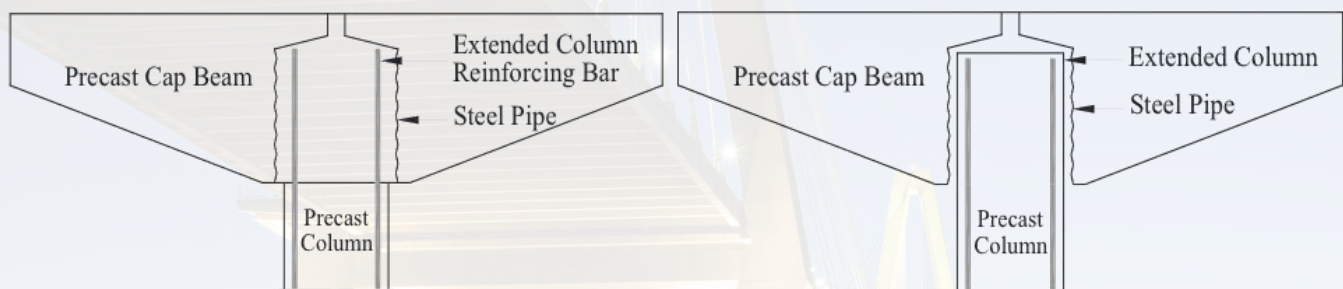
Proposed design guidelines in AASHTO LRFD format for precast bridge cap beams with pocket connections for seismic regions

Research Advisory Panel:

Bijan Khaleghi, Washington State DOT; Elmer Marx, Alaska DOT&PF; Tom Ostrom, Caltrans

Status:

Completed 2015. Final report was reviewed by the Research Advisory Panel, comments were addressed, and the report was finalized and posted.



Two types of cap-beam pocket connections

IMPACT:

“Development of reliable precast bridge bent systems with pocket connections will advance ABC in high seismic regions.”

– Bijan Khaleghi, State Bridge Design Engineer, Washington State DOT

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UNR RESEARCH ASSOCIATES



Ali Mehrsoroush is a post-doctoral scholar at UNR. He received his B.S. from the Isfahan University of Technology in Iran, M.S. from the Sharif University of Technology in Iran, and Ph.D. from UNR. In his Ph.D. curriculum, he developed two types of novel resilient ABC connections to be utilized in both ABC and cast-in-place construction. He is currently working on two different projects funded by Caltrans and the Nevada DOT. Caltrans and the Nevada DOT are providing funds that are partially counted as UNR's ABC-UTC match.

Mostafa Tazarv was a post-doctoral scholar at UNR until August 2015. He received his B.S. from the University of Tabriz in Iran, M.S. from Sharif University of Technology in Iran, followed by graduate study at Carleton University in Canada, and Ph.D. from UNR. For his Ph.D., he developed a new generation of bridge columns that can be built rapidly, with seismic performance that is at least equal to conventional bridge columns. He is currently working on ABC-UTC projects to develop design guidelines for pocket connections and mechanical bar splices, types of ABC connections. He is now an Assistant Professor of Civil Engineering at South Dakota State University.



UNR GRADUATE STUDENT RESEARCH ASSISTANTS



Bahareh Abdollahi is a Ph.D. candidate in structural engineering at UNR. She completed her B.Sc. and M.Sc. degrees in civil engineering and earthquake engineering at the University of Tehran in Iran. She is currently working on seismic interaction of soil-abutment systems in skewed bridges funded by Caltrans. Her research interest topics include seismic retrofit, bridge engineering, and soil-structure interaction. Caltrans is providing funds that are partially counted as UNR's ABC-UTC match.

José Benjumea is a Ph.D. student in structural and earthquake engineering at UNR. He obtained his B.Sc. and M.Sc. degrees in civil engineering from Universidad Industrial de Santander, Colombia. In the Ph.D. program, he is working on analytical and experimental studies of a two-span ABC bridge with PC/PS girders funded by Caltrans. His research interests include seismic response of short and medium span bridges, ABC, and response of bridges to accidental loads. Caltrans is providing funds that are partially counted as UNR's ABC-UTC match.



Mehrdad Mehraein is a Ph.D. candidate in earthquake and structural engineering at UNR. He obtained his M.Sc. in earthquake engineering from Sharif University of Technology and his B.Sc. from Amirkabir University of Technology in Iran. For his Ph.D. he is working on column to pile-shaft ABC connections of bridges, funded by Caltrans. His research interests include performance-based design of structures, precast construction, ABC, and experimental studies of structures. Caltrans is providing funds that are partially counted as UNR's ABC-UTC match.

Alireza Mohebbi is a Ph.D. candidate in structural engineering at UNR. He obtained his M.Sc. degree in structural engineering from UNR. In the Ph.D. program, he is working on the UNR ABC-UTC project on development and seismic evaluation of pier systems with pocket connections and hollow PT/UHPC columns. His research interests include seismic response of bridges, ABC, and durability of self-consolidating concrete (SCC). He is active in the Earthquake Engineering Research Institute (EERI) student chapter at UNR, currently serving as its president.



UNR GRADUATE STUDENT RESEARCH ASSISTANTS



Elmira Shoushtari is a Ph.D. candidate in structural engineering at UNR. She received her B.Sc degree in Civil Engineering from Sharif University of Technology, Iran, and her M.Sc degree in Earthquake Engineering from Amirkabir University of Technology, Iran. In her Ph.D. program, she is working on an experimental and analytical evaluation of an ABC two-span steel girder bridge funded by the ABC-UTC, with focus on seismic resiliency and serviceability. Her research interests include ABC, large scale testing, and seismic behavior of bridges.

Grishma Shrestha is a Ph.D. candidate in structural engineering at UNR. She obtained her M.Sc. degree in structural engineering from Southern Illinois University Edwardsville (SIUE). In the Ph.D. program, she is working on precast design of seismic bridge decks, funded by Caltrans. Caltrans is providing funds that are partially counted as UNR's ABC-UTC match. Her academic interests include finite element analysis, seismic responses of bridges, accelerated bridge construction, and, ultimately, design of these elements.



UNR UNDERGRADUATE RESEARCH INTERNS

UNR has an undergraduate research internship program. The internships are used to attract undergraduate students to transportation-related employment. UNR has hired an undergraduate intern to promote the involvement of undergraduate students in the ABC-UTC. Qualified students are recruited to work on ABC-UTC research projects.



Colton Schaefer is an undergraduate student of civil engineering at UNR. In the undergraduate program, he has placed an emphasis on structural engineering courses and is currently under the newly developed Accelerated BS/MS Program. He plans to receive his M.S. in structural engineering at UNR within a year of completing his undergraduate program. He is working on the ABC-UTC project to evaluate seismic performance of bridge columns with couplers and develop design guidelines.

RESEARCH PROJECTS INITIATED IN 2015 (YEAR TWO)

FLORIDA INTERNATIONAL UNIVERSITY

Alternative ABC Connections Utilizing UHPC: *This project will focus on the exploration of UHPC joint details for use in ABC projects through experimental, analytical, and numerical work.*

Extending Application of SDCL to ABC (Phase II – Experimental): The objective of this second phase is to experimentally investigate SDCL for steel bridge details developed in Phase I of the project.

Estimating Total Cost of Bridge Construction using ABC and Conventional Methods of Construction (Phase II): The objective of this project is to create a framework for evaluating and utilizing public costs as part of the decision-making processes associated with bridge construction and the development of a public cost analysis and estimation tool. This is Phase II of the project.

Demolition Requirements for Bridge Construction Projects – Best Practices Guideline: The goal of this project is to determine the current state of practice and state of the art in bridge demolition (both conventional and ABC) and develop a best practices guideline for bridge demolition.

IOWA STATE UNIVERSITY

Material Design and Structural Configuration of Link Slabs for ABC Applications: The objective of this research is to develop details and recommendations to properly implement a link slab in joint-less bridges constructed with ABC techniques. This will be accomplished through a comprehensive set of experimental tests and numerical simulations.

Material Design and Structural Configuration of Link Slabs for ABC Applications: The objective of this research is to develop details and recommendations to properly implement a link slab in joint-less bridges constructed with ABC techniques. This will be accomplished through a comprehensive set of experimental tests and numerical simulations.

An Integrated Project to Enterprise-Level Decision Making Framework for Prioritization of Accelerated Bridge Construction: This project aims to develop a decision-making algorithm that brings together the project-level decision process that involves the choice of optimized construction techniques together with the enterprise-level process that implements regional prioritization schemes considering indirect costs (such as drivers' delay, economic impact, opportunity losses, economic growth, and social investments) in addition to the direct costs associated with implementation of the ABC techniques.

Rapid Bridge Demolition Plan Review Guidance: This research will develop rapid bridge demolition plan review guidance, based on a comprehensive literature review; surveys of DOTs, and demolition contractors and consultants; and a synthesis of the information obtained.

UNIVERSITY OF NEVADA AT RENO

Shake Table Studies of a Bridge System with ABC Connections: ABC connections for prefabricated members are particularly critical in moderate and high seismic zones because earthquake forces place high demand on inelastic deformation of adjoining columns. Structural integrity of the bridge has to be maintained by capacity-protected connections that experience little or no damage. The overall objective of the proposed study is to investigate the seismic performance of a large-scale bridge system that integrates some of the more promising ABC connections that have been proof tested as individual components.



ABC-UTC EDUCATION and WORKFORCE DEVELOPMENT

GRADUATE STUDENTS COMPLETING DEGREES IN 2014-2015

The ABC-UTC is pleased to announce its first five graduates in 2014-2015.



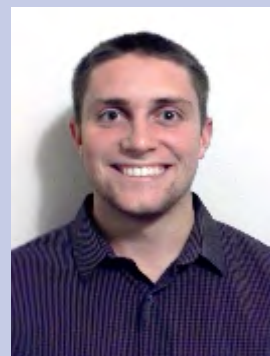
Meghan Cronin received her Master of Science degree with emphasis in structural engineering from Iowa State University in December 2015. She worked on ISU's ABC-UTC project, "Synthesis of Rapid Bridge Rehabilitation," in the Department of Civil, Construction and Environmental Engineering. She earned her Bachelor's degree in Civil Engineering from ISU in May 2014. Following graduate school, Meghan accepted an engineering position with Meyer Borgman Johnson (MBJ) in Minneapolis, Minnesota. She is working in the aviation group at MBJ, specifically focusing on new and renovation work at several regional airports.

Jawad Gull received his doctoral degree from FIU in January 2015. He served as the assistant director of the ABC-UTC and was PI for ABC-UTC research projects addressing issues related to service life and database management of ABC projects. He has worked on diverse engineering projects in the United States, Japan, and Pakistan. Following graduation, Dr. Gull accepted a position as bridge designer at HDR. He is currently working on the I-4 Ultimate project that involves design and construction of over 60 new bridges and replacement of over 70 existing bridge bridges. He is an active member of ASCE, ACI, and the ABC-UTC mentoring team.



Ali Mehrsoroush received his doctoral degree from UNR in December 2014. He received his B.S. from the Isfahan University of Technology and M.S. from the Sharif University of Technology, both in Iran. In his Ph.D. curriculum he developed two types of novel resilient ABC connections to be utilized in both ABC and cast-in-place bridge construction. He is currently a post-doctoral scholar at UNR and is working on projects funded by Caltrans and the Nevada DOT to expand the probabilistic damage control analysis approach for bridge columns and to identify earthquake-resistant precast bridge pier systems. Project funds are partially counted as UNR's ABC-UTC match.

Samuel Redd received his M.Sc. degree with emphasis in structural engineering from ISU in December 2015. He worked on ISU's ABC-UTC project, "Strength, Durability, and Application of Grouted Couplers for Integral Abutments in ABC Projects," in the Department of Civil, Construction and Environmental Engineering. Samuel holds a B.S. cum laude in Construction Engineering from ISU. As an undergraduate he worked at the Bridge Engineering Center at ISU for over a year helping conduct research. Following graduate school, Samuel started working for Felsburg, Holt and Ullevig in Denver, Colorado as a bridge engineer.



GRADUATE STUDENTS COMPLETING DEGREES IN 2014–2015



Mostafa Tazarv received his doctoral degree from UNR in August 2014 and was a post-doctoral scholar at UNR until August 2015. He received his B.S. from the University of Tabriz and M.S. from Sharif University of Technology, both in Iran, followed by a year of graduate study at Carleton University, Canada. In his Ph.D. curriculum, he developed a new generation of bridge columns that can be built rapidly, with seismic performance that is at least equal to conventional bridge columns. He also worked on ABC-UTC projects to develop design guidelines for pocket connections and mechanical bar splices, types of ABC connections. He is now an Assistant Professor of Civil Engineering at South Dakota State University.

NEXT GENERATION OF FACULTY LEADERS



Mostafa Tazarv, Ph.D.

Graduated August 2014, University of Nevada, Reno

Part-time post-doc on ABC-UTC project, September 2014 – August 2015

Assistant Professor of Civil Engineering, South Dakota State University

Conducting new ABC research funded by other sources

Mostafa Tazarv received his B.S. from the University of Tabriz, Iran, M.S. from Sharif University of Technology, Iran, followed by year of graduate study at Carleton University, Canada, and Ph.D. from the University of Nevada, Reno. His research interests include seismic behavior of concrete structures, innovative materials, resilient infrastructures, accelerated bridge construction, large-scale testing, and nonlinear

structural analysis. In his PhD curriculum, he developed a new generation of bridge columns that can be built relatively in short time but with seismic performance that is equal to or better than conventionally cast-in-place bridge columns. He is currently working on three different projects funded by the National Cooperative Highway Research Program (NCHRP) and the ABC-UTC. The scope of the NCHRP project is to explore new bridge column performance with innovative energy dissipating systems and propose design guidelines for innovative columns. The objective of ABC-UTC projects is to develop design guidelines for pocket connections and mechanical bar splices, which are types of accelerated bridge construction connections.

OUTSTANDING STUDENT OF THE YEAR

2015 was the first year for the ABC-UTC to select one of its graduate students for the Council of University Transportation Center's Outstanding Student of the Year competition. The ABC-UTC's award recipient was Ms. Azadeh Jaber Jahromi, graduate research assistant at FIU.

Ms. Azadeh Jaber Jahromi received her M.Sc. from Iran University of Science and Technology, Tehran, Iran. She has published four papers based on her M.Sc. work, all related to bridge engineering. Ms. Jahromi worked for seven years as a structural engineer following completion of her B.S. degree, before entering the Ph.D. program at Florida International University. She completed one year of Ph.D. studies at North Dakota State University before transferring to FIU. She is also involved with the American Concrete Institute (ACI) Student Chapter of FIU.

Ms. Jahromi's research work at FIU is related to development of a customized service life manual for designing bridges using the ABC philosophy. Her work is a continuation of a major document developed by the SHRP2 R19A project for service life design of bridges. The design of ABC projects for service life is among the top two questions being asked by bridge professionals across the country. Once completed, Ms. Jahromi's work will make a valuable contribution to the body of knowledge in bridge engineering.



Ms. Azadeh Jaber Jahromi
Ph.D. Candidate | Structural Engineering | 2018
Florida International University

Title of dissertation:
Development of customized manual for design of ABC projects for service life



Ms. Azadeh Jaber Jahromi with former Transportation Secretary Norman Mineta

MENTORING PROGRAM

In 2015, the ABC-UTC continued its mentoring program to create a conduit for communication between students working on ABC-UTC research projects and industry representatives with interests in the ABC-UTC and in ABC in general. All graduate students participating in ABC-UTC funded activities are required to participate in the mentoring program. ISU facilitates the ABC-UTC mentoring program. The 2015 ABC-UTC mentors are:



Mike Culmo, Vice President of CME Associates, Inc., has over 25 years of experience in structural engineering. He is a nationally-recognized expert in ABC practices. Mr. Culmo has worked on several high profile projects including Massachusetts's Fast 14 Bridge Replacement Project and has helped Departments of Transportation including Utah, Connecticut and Rhode Island in the development and furtherance of pilot projects and standards using ABC methods. He was the recipient of the 2014 American Institute of Steel Construction's (AISC) Special Achievement Award.

Reza Farimani joined Thornton Tomasetti in 2006, and has experience in the structural analysis and design of steel and concrete structures including high-rise, commercial, education, residential, sports, mixed-use developments and investigations. He is responsible for analysis, design, preparation of drawings and coordination as well as communication with outside consultants.



Jawad Gull is bridge designer at HDR and has 9 years of experience in research and structural engineering. He obtained his doctoral degree from FIU in January 2015. Dr. Gull worked on several research projects and successfully addressed issues related to construction, inspection, and rehabilitation of bridges. He served as the assistant director of the ABC-UTC at FIU. He was principal investigator in ABC-UTC research projects addressing issues related to service life and data base management of ABC projects. He is a member of the ABC-UTC mentoring team.

MENTORING PROGRAM



Finn Hubbard joined Fish & Associates, Inc. in 2012. Over the past 30 plus years, Mr. Hubbard has been involved in a various structural design and construction projects within the transportation industry. He led the stabilization and reconstruction efforts for the Hoan Bridge failure in Downtown Milwaukee, Wisconsin in December 2000. This work included the emergency response, stabilization, implosion, cleanup and reconstruction of the failed span in a highly congested urban environment. The forensic investigation of the Hoan failure changed AASHTO bridge specifications.

Michael LaViolette joined HDR following many years as a senior bridge manager at HNTB and as a bridge research specialist at the Iowa State University Bridge Engineering Center. He has a unique combination of 15 years of practical bridge design and construction experience along with academic research experience with proven results. Mr. LaViolette is currently serving as the principal investigator on several research projects. He is an active member of TRB's Construction of Bridges and Structures Committee (AFH40) and PCI's Committee on Bridges.



Francesco Russo is a senior structural engineer and technical and project manager at Michael Baker Corp. His experience includes all phases of engineering practice, including project engineering; staff, schedule and financial management; construction support services; forensic investigations; and report writing. He has design-build experience on multiple projects, including serving on design teams, as an owner's advisor, and directing design quality control efforts for a mega design-build project.

Ardalan Sherafati is structural project engineer at BlueScope Construction Inc. As a structural engineer he has been involved in analysis and design of stadiums, buildings, and underground structures. His Ph.D. dissertation was part of the SHRP2-R19A project; he proposed and successfully tested a pile/cap connection detail that was proven to significantly increase the length of jointless bridges. On a separate research topic, he researched the folded plate girder system and led associated experimental studies conducted at the University of Nebraska.



GO – ABC!

Go – ABC! aims to develop the future transportation workforce by educating and stimulating young minds about ABC. In 2015, the ABC-UTC consortium universities continued quarterly Go! postings on ABC-related articles for teens.

IOWA STATE UNIVERSITY Institute for Transportation

BUILD BRIDGES FASTER – BUT CAN YOU KEEP THEM TOGETHER?

posted January 2015

What does a miniature paper house have in common with accelerated bridge construction (ABC)? The need for sturdy connections.

On YouTube you can find videos with instructions for making small model/doll houses out of cardboard. First, all the pieces are cut out. Then the pieces are assembled and connected with glue or tape to make the house sturdy. Now let's go to bridges ...



Taking a prefab pier to build a bridge



CIP integral bridge abutment

ACCELERATED BRIDGE CONSTRUCTION: CONSTRUCTABILITY IS KEY!

posted May 2015

More than 100 years ago, Ransom Olds and Henry Ford revolutionized manufacturing processes when they developed the assembly line for constructing automobiles faster. ... Whether for automobiles or bridges, these three characteristics define “constructability.” Constructability is the key to successful accelerated construction of a high quality end product. Like automobile assembly lines, accelerated bridge construction (ABC) typically relies on prefabricated parts ...

ABC ACTIVITY: BALSA-WOOD BRIDGES

posted July 2015

When learning about structural engineering, the building of balsa-wood bridges can be a key activity in any engineering class. You can find these scaled bridges made out of balsa wood, lollipop sticks, or even spaghetti (or whatever else is on hand). It is common to use simple weights (such as a few soup cans) to identify how structures behave under stationary loads. With modern, real-world bridge engineering difficulties in mind, this fun activity can get a little more interesting ...



HS students at FIU transportation camp design & build a balsa-wood bridge



Pocket in bridge footing

ABC: BRIDGE IN A “POCKET!”

posted October 2015

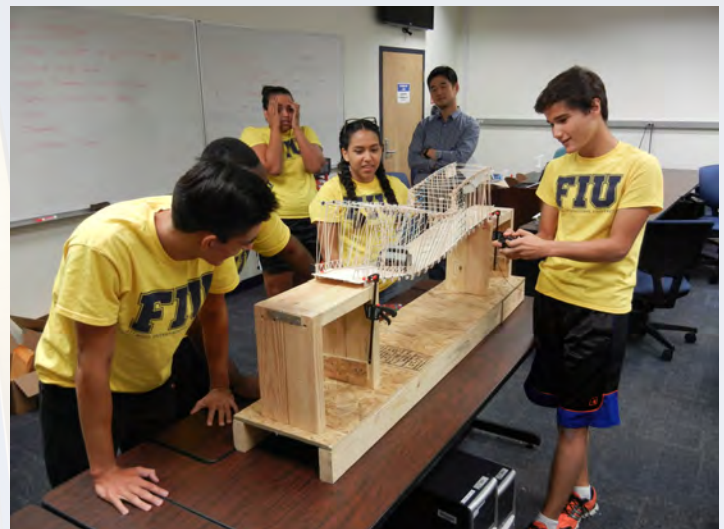
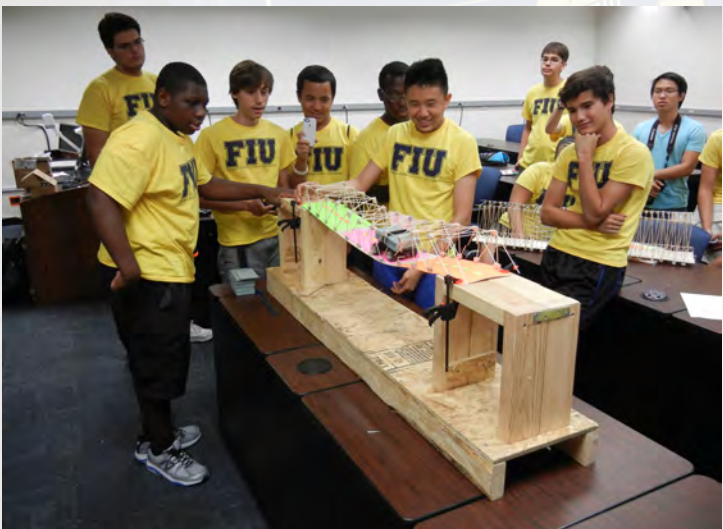
Yes, it is a pocket! But it's not exactly the size of your back pocket, it's actually much bigger. Take a look (see Figure 1)! The photo shows a pocket in a bridge footing. See that square hole in the middle? That's what we're going to be talking about. This one is a test model. The hole is 2 feet by 2 feet. In a real bridge ...

FIU's SUMMER TRANSPORTATION CAMP

One of the focal points of FIU's Summer Transportation Camp, initiated in summer 2015, was ABC. Students were introduced to ABC techniques through a series of lessons and then were given the opportunity to explore their use in a balsa wood bridge project. Student teams were required to prefabricate their bridges in three pieces and transport them to the bridge site.



They then had 30 minutes to construct their final bridge. Each team tested the capacity of their small scale model bridges by driving over them with a remote-controlled toy truck.



Teams load balsa wood bridges



18 Miami-area high school students ranging from sophomore to seniors attended camp

ISU's YOUNG ENGINEERS AND SCIENTISTS (YES) PROGRAM

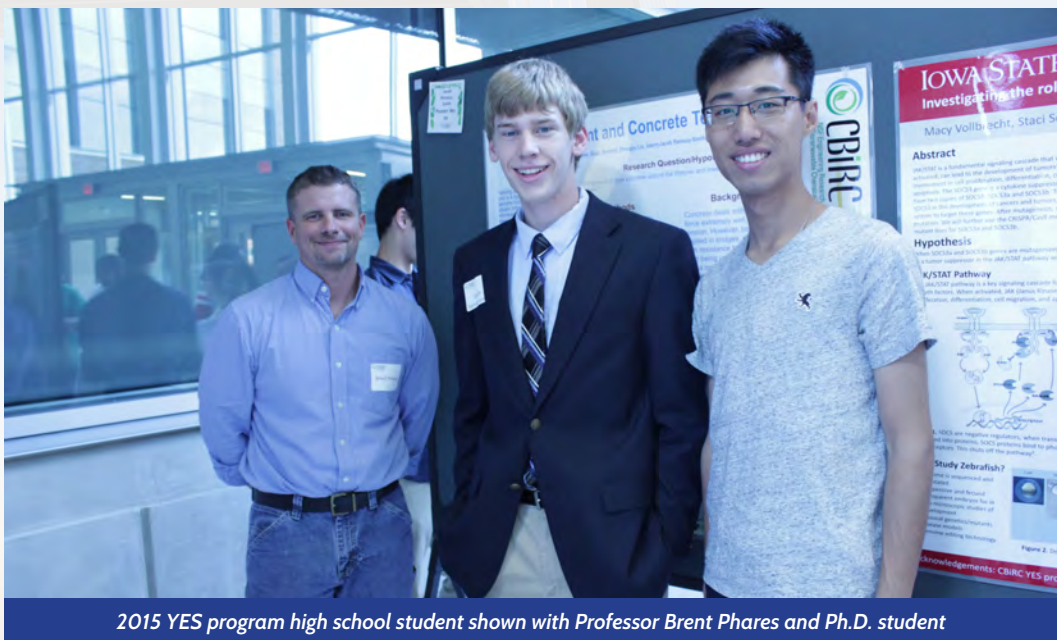
ISU's Young Engineers and Scientists (YES) Program, initiated in summer 2015, is a pre-college education program that sponsors and supports 11th and 12th grade students by pairing them with Iowa State University faculty mentors as they cultivate ideas that can be developed into projects for submission to state science and technology fairs. With the opportunity to participate in on-going research, students are exposed to countless academic and career opportunities in engineering.

IOWA STATE UNIVERSITY
Institute for Transportation

PROGRAM OBJECTIVES

- To provide high school students with opportunities to participate in on-going research related to bio-renewables
- To provide high school students exposure to both academic and career opportunities in engineering
- To provide high school students with ideas that can be developed into projects for submission to state Science and Technology Fairs
- Students may arrange with their high schools to receive independent credit towards their high school transcript

ABC was included in a laboratory study aimed at developing adjacent box beam connection details that are resilient and long-lasting. This work consisted of conducting material characterization tests and controlled small-scale, early-age testing of potential solutions.



2015 YES program high school student shown with Professor Brent Phares and Ph.D. student


ISU's AASHTO RIDES PROGRAM

Working with the Iowa State University Regional UTC – the Midwest Transportation Consortium – the ABC-UTC initiated a program modelled after the AASHTO Roadways into Developing Elementary Students (RIDES) program. This initiative involves several different components including the introduction of bridge design in several classrooms across Iowa, hosting of multiple bridge building competitions, and integration into several of ISU's science, technology, engineering, and mathematics (STEM) initiatives.

IOWA STATE UNIVERSITY
Institute for Transportation

ABC is incorporated in a segment with discussion of how long it takes to build bridges and how engineers are working to reduce this time significantly.

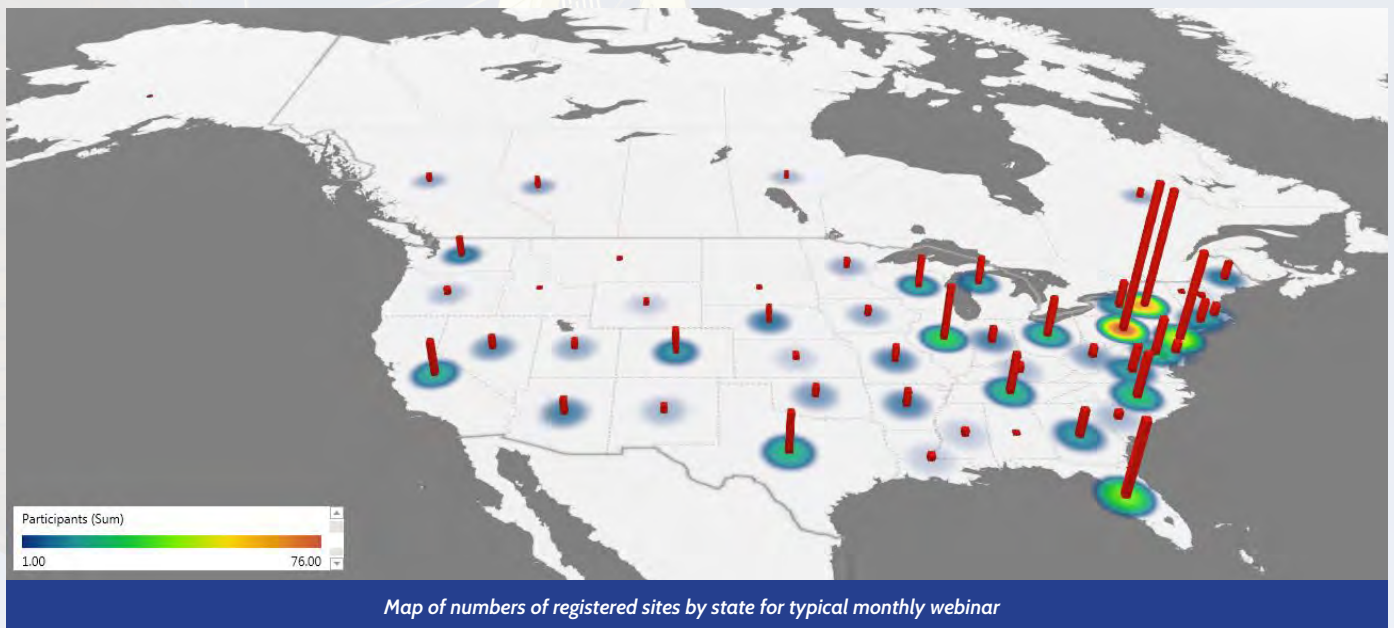




ABC-UTC TECHNOLOGY TRANSFER

MONTHLY WEBINARS

In 2015, the ABC-UTC hosted 12 monthly webinars under the leadership of its advisory board: Atorod Azizinamini, ABC-UTC Director; Mary Lou Ralls, former Texas State Bridge Engineer and Director of Technology Transfer, ABC-UTC; Ben Beerman, FHWA Resource Center Bridge Engineer and the FHWA lead for Prefabricated Bridge Elements and Systems (PBES) for ABC Initiatives; Kevin Thompson, former California State Bridge Engineer, now with the California High Speed Rail Authority; Jugesh Kapur, former Washington State Bridge Engineer, now with Burns & McDonnell; and Paul Liles, former Georgia State Bridge Engineer.



JANUARY 2015

Detailing of ABC Bridges for Simplicity and Durability

by Michael P. Culmo P.E., Vice President of Transportation and Structures, CME Associates, Inc., East Hartford, CT

No. of Registered Sites: 700



FEBRUARY 2015

PBES for Local Systems – Iowa’s Perspective, Experience, and Research

by Ahmad Abu-Hawash P.E., Chief Structural Engineer, Iowa DOT; Vanessa Goetz P.E., Secondary Road Research Engineer, Iowa DOT; Brent Phares Ph.D., P.E., Researcher, Iowa State University & ABC-UTC

No. of Registered Sites: > 550



MARCH 2015

Utah DOT’s Experience with UHPC

by Carmen Swanwick P.E., Chief Structural Engineer, Utah DOT; Cheryl Hersh Simmons P.E., Structures Design Manager, Utah DOT; Eric Wells, Area Manager, Granite Construction Company

No. of Registered Sites: > 600

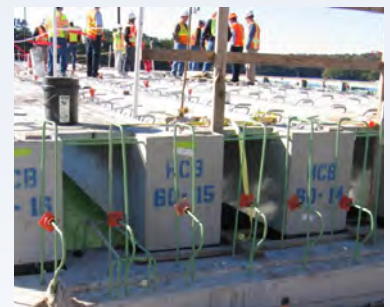


APRIL 2015

Incorporating Proprietary Products in ABC Projects

by John Huyer P.E., Contract Administration Engineer, FHWA Office of Infrastructure; Dale Peabody P.E., Director of Transportation Research, Maine DOT

No. of Registered Sites: 450



MAY 2015

Boeing North Bridge in Washington State

by Gregory A. Banks, P.E., Project Engineer, BergerABAM

No. of Registered Sites: 450

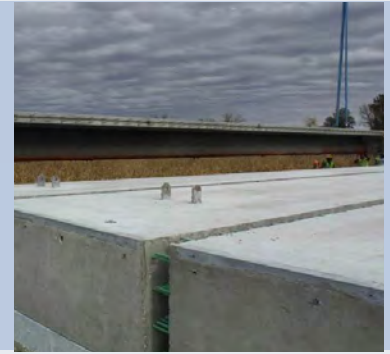


JUNE 2015

GRS-IBS with Folded Plate Girders in Nebraska IBRD/ABC/EDC Implementation

by Khalil Jaber P.E., Deputy Director for Engineering, Nebraska Department of Roads; Fouad Jaber P.E., Assistant State Bridge Engineer, NDOR; Matt Macey P.E., VP & Chief Structural Engineer, CDR Bridge Systems

No. of Registered Sites: 750



JULY 2015

Emerging ABC Connection Details for High Seismic Areas

by M. Saiid Saiidi Ph.D., P.E., Professor, University of Nevada, Reno; Sri Sritharan Ph.D., Professor, Iowa State University

No. of Registered Sites: 500



AUGUST 2015

PennDOT Replacement of Route 581 Bridge during Weekend Closures

by Tom Macioce P.E., Chief Bridge Engineer, PennDOT; Harivadan Parikh P.E., District Bridge Engineer, PennDOT District 8

No. of Registered Sites: 700



SEPTEMBER 2015

Oklahoma DOT ABC Bridge Replacement on SH-51 over Cottonwood Creek

by Randle White P.E., Division Engineer, Field Division 8, Oklahoma DOT; Jason Langhammer P.E., Senior Project Manager, Garver

No. of Registered Sites: > 600



OCTOBER 2015

Connecticut DOT's Weekend Closure to Replace I-84 Bridges over Marion Avenue

by Timothy D. Fields P.E., Transportation Principal Engineer, Connecticut DOT; Mary E. Baker P.E., Transportation Supervising Engineer, Connecticut DOT; Mohammed Bishtawi P.E., Transportation Supervising Engineer, Connecticut DOT

No. of Registered Sites: > 550



NOVEMBER 2015

Iowa County Bridge Constructed of K-UHPC

by Brian Keierleber P.E., County Engineer, Buchanan County, Iowa; Alex Davis P.E., Assistant County Engineer, Buchanan County, Iowa; Hosin “David” Lee Ph.D., P.E., Professor, University of Iowa

No. of Registered Sites: > 400



DECEMBER 2015

Industry Perspective on Precast Element Details for Successful ABC Projects

by William Nickas, P.E., Managing Director, Transportation Services, Precast/Prestressed Concrete Institute; Keith Kaufman, Ph.D., P.E., Chief Engineer, Prestressed Concrete Division, Knife River Corporation

No. of Registered Sites: 700



IN-DEPTH WEB TRAINING

The ABC-UTC continued its annual in-depth web training during 2015 to provide more detailed coverage of select projects and topics related to ABC. Held in November, the training was four hours long and consisted of six modules. This year's training featured the Milton-Madison, a vital link across the Ohio River between Kentucky and Indiana. This project was the longest lateral slide of its kind in North America. The four river spans of the steel truss bridge, totaling 2,430 feet in length with 40 feet of usable deck width and a self-weight over 15,000 tons, were slid laterally 55 feet from temporary piers onto permanent refurbished piers in April 2014. Bridge closures were limited to a few weeks over the duration of the project.

MODULE 1: INTRODUCTION

by Anne M. Rearick, P.E., Director of Bridges, Indiana DOT; and Kevin Hetrick, P.E., Indiana Transportation Manager, Clark Dietz, Inc. – Engineers

MODULE 2: PRELIMINARY ENGINEERING AND OWNER'S CONSULTANT OVERSIGHT

by Aaron Stover, P.E., S.E., Project Manager, Michael Baker International

MODULE 3: DESIGN-BUILD BIDDING, ABC, AND MAINTENANCE OF TRAFFIC

by Travis Butz, P.E., Senior Bridge Engineer, Burgess & Niple, Inc.

MODULE 4: PIER REHABILITATION DESIGN AND CONSTRUCTION

by Travis Butz, P.E., Senior Bridge Engineer, Burgess & Niple, Inc.

MODULE 5: MAIN SPANS (TRUSSES) DESIGN AND CONSTRUCTION

by Murray Johnson, P.E., Vice President, Project Director, Buckland & Taylor

MODULE 6: CONSTRUCTION

by Charlie Gannon, Project Manager, Walsh Construction



NATIONAL ABC PROJECT DATABASE

In 2015 the ABC-UTC, in partnership with FHWA, posted the National ABC Project Database on the ABC-UTC website. The database was expanded from its origin, FHWA's National ABC Project Exchange, through FIU's 2014 "Compilation of ABC Solutions" research project completed in 2015. The searchable database presents information on completed ABC projects in a manner useful to designers and other bridge professionals. The functionality of the database was enhanced to include a submission process for the addition of new ABC projects.



ABC UTC ACCELERATED BRIDGE CONSTRUCTION UNIVERSITY TRANSPORTATION CENTER **FIU** FLORIDA INTERNATIONAL UNIVERSITY

Home Research Projects Education Technology Transfer Resources Events News v 1.0

Project Database Research Database

Bridge Summary Sheet

2011 - Salem Street Bridge Eastbound (93Fast14)

Year ABC Built: 2011

State: Massachusetts

Owner: State

Location: Urban

Spans: Three-span

Beam Material: Concrete

Max Span Length: 78.00

Total Bridge Length: 160.00

Construction Equipment: Other

State ID #: M-12-027-3B6DOTNBI

NBI #: BRI-093(534) & STP-093-1(524)

Coordinates: Latitude: 42.418873, Longitude: -71.104507

Bridge Description

Home
Project Database
Research Database
Submit Project
Submit Research
Updates/Comments/Assistance
Training Videos
Overview
Navigation
Searching Projects
Keywords
Project Summary Sheets
Downloadable Database
Key Search Words

Example project in project database

ABC UTC ACCELERATED BRIDGE CONSTRUCTION UNIVERSITY TRANSPORTATION CENTER **FIU** FLORIDA INTERNATIONAL UNIVERSITY

Home Research Projects Education Technology Transfer Resources Events News v 1.0

Project Database Research Database

Recommend a Project

Complete the Following Steps: 1

The information that will be required for full submission can be found in the below MS Word Template. The majority of this information will be gathered in the second stage of the submission process, but this Template can be used to aid in the submission process.

MS Word Template for Submission

Submitters Information:

First Name: Last Name:

Title:

Position: Organization:

Email: Phone:

Home
Project Database
Research Database
Submit Project
Submit Research
Updates/Comments/Assistance
Training Videos
Overview
Navigation
Searching Projects
Keywords
Project Summary Sheets
Downloadable Database
Key Search Words

Step one of two-step submission process

NATIONAL ABC CONFERENCE

DECEMBER 6–8, 2015 | HYATT REGENCY HOTEL – DOWNTOWN MIAMI, FLORIDA



Mal Kerley (right), former Chair of AASHTO SCOBS and General Session moderator, welcomes Gregory Nadeau, FHWA Administrator, to deliver the keynote talk during the General Session



General Session



General Session speakers

The 2015 National ABC Conference, sponsored by the ABC-UTC, was co-sponsored by 30 State Departments of Transportation, the Federal Highway Administration, the National Concrete Bridge Council, the National Steel Bridge Alliance, and the Transportation Research Board, including its Second Strategic Highway Research Program. Congressman Mario Diaz-Balart, Congressman Carlos Curbelo, and FHWA Administrator Gregory Nadeau were the Conference's keynote speakers.

Approximately 650 participants attended the Conference, including over 150 bridge engineers from state departments of transportation, 40 bridge engineers from the Federal Highway Administration, and various consultants and other bridge professionals. Ten half-day or full-day pre-conference workshops were held on Sunday, December 6. The Conference began on Monday, December 7 with a general session followed by 30 technical sessions with 115 thirty-minute presentations. The Conference concluded on Tuesday, December 8.

A total of 42 companies exhibited ABC-related products and services to attendees during the Conference. Several of the exhibitors brought full-scale products for attendees' hands-on experience, including Sarens' self-propelled modular transporter and SPS North America's Sandwich Plate System. Thirteen agencies and firms sponsored travel scholarships for bridge engineers from departments of transportation to attend the Conference.

The 2017 National ABC Conference will be held December 6–8, 2017 in Miami.

To see highlights (including video) from the 2015 Conference, please visit:

www.abc-utc.fiu.edu
(Technology Transfer – Conference Archives)

2015 NATIONAL ABC CONFERENCE

CO-SPONSORS

- Alabama Department of Transportation
- Alaska Department of Transportation & Public Facilities
- Arizona Department of Transportation
- California Department of Transportation
- Colorado Department of Transportation
- Delaware Department of Transportation
- Florida Department of Transportation
- Georgia Department of Transportation
- Illinois Department of Transportation
- Iowa Department of Transportation
- Kansas Department of Transportation
- Louisiana Department of Transportation and Development
- Michigan Department of Transportation
- Minnesota Department of Transportation
- Nebraska Department of Roads
- Nevada Department of Transportation
- New Hampshire Department of Transportation
- New Jersey Department of Transportation
- New York State Department of Transportation
- Oregon Department of Transportation
- Pennsylvania Department of Transportation
- South Carolina Department of Transportation
- South Dakota Department of Transportation
- Tennessee Department of Transportation
- Texas Department of Transportation
- Utah Department of Transportation
- Vermont Agency of Transportation
- Virginia Department of Transportation
- Washington State Department of Transportation
- Wisconsin Department of Transportation
- Federal Highway Administration (FHWA)
- National Concrete Bridge Council (NCBC)
- National Steel Bridge Alliance (NSBA)
- Transportation Research Board (TRB)
- Strategic Highway Research Program (SHRP2)

2015 NATIONAL ABC CONFERENCE

PRE-CONFERENCE WORKSHOPS



W-1	EMERGING TECHNOLOGIES, 8:00 a.m. – 5:00 p.m. SPEAKERS: John Huyer, FHWA Office of Infrastructure; Wayne Frankhauser, Jr., Maine DOT; John Hillman, HCB, Inc.; Kay Jimison, SPS North America; Matthew Macey, CDR Bridge Systems; Rolando Moreau, Intelligent Engineering; Eugene Sobecki, Acrow Corporation of America; Kenneth Sweeney, AIT Bridges
W-2	BRIDGE SYSTEM MOVES, 8:00 a.m. – 12:00 p.m. SPEAKERS: Steven Sarens, Sarens Group; Mattias Price, Sarens Group
W-3	PROGRAMMATIC IMPLEMENTATION OF ABC IN STATE DOTs, 8:00 a.m. – 5:00 p.m. SPEAKERS: Ben Beerman, FHWA; Ahmad Abu-Hawash, Iowa DOT; Thomas Donald, MassDOT; Bruce Johnson, Oregon DOT; David Juntunen, Michigan DOT; Bijan Khaleghi, Washington State DOT; Dorie Mellon, California DOT; William Oliva, Wisconsin DOT; Mathew Royce, New York State DOT; Carmen Swanwick, Utah DOT; Wayne Symonds, Vermont Agency of Transportation
W-4	LIGHTWEIGHT CONCRETE – A TOOL FOR ACCELERATED BRIDGE CONSTRUCTION, 8:00 a.m. – 12:00 p.m. SPEAKER: Reid Castrodale, Castrodale Engineering Consultants
W-5	DESIGN CRITERIA AND CONNECTIONS FOR APPLICATION OF ABC IN SEISMIC REGIONS, 1:00 – 5:00 p.m. SPEAKERS: Atorod Azizinamini, Florida International University; M. “Saiid” Saiidi, University of Nevada, Reno; Max Stephens, University of Washington; Dawn Lehman, University of Washington; Charles Roeder, University of Washington; John F. Stanton, University of Washington; Bijan Khaleghi, WSDOT
W-6	STEEL BRIDGE DESIGN WORKSHOP LATEST DEVELOPMENT IN APPLICATION OF STEEL BRIDGES FOR ABC AND BEYOND, 8:00 a.m. – 12:00 p.m. SPEAKERS: Michael Culmo, CME Associates, Inc.; Ronnie Medlock, High Steel Structures; Robert Conner, Purdue University; Chris Garrell, National Steel Bridge Alliance
W-7	UHPC: MATERIAL PROPERTIES, PRODUCTION, APPLICATION AND WHAT YOU SHOULD KNOW WHEN USING UHPC, 8:00 a.m. – 5:00 p.m. SPEAKERS: Paul White, Lafarge North America; Ben Graybeal, FHWA; Ben Beerman, FHWA; Atorod Azizinamini, Florida International University
W-8	RE-USE OF SUBSTRUCTURES IN ABC PROJECTS, 1:00 – 5:00 p.m. SPEAKERS: Jerry DiMaggio, Applied Research Associates, Inc.; Reid Castrodale, Castrodale Engineering Consultants, PC; Bruce Peterson, Modjeski and Masters; Maury Tayarani, Pennoni Associates, Inc.; David Whitmore, Vector Corrosion Technologies
W-9	ABC’S OF ABC – ESSENTIAL ABC ELEMENTS FOR BRIDGE PROFESSIONALS, 8:00 a.m. – 12:00 p.m. SPEAKER: Bala Sivakumar, HNTB Corp.
W-10	CONCRETE BRIDGE DESIGN, 1:00 – 5:00 p.m. SPEAKERS: Kevin Eisenbeis, Burns and McDonnell; Edwin McDougale, Ross Bryan Associates; William Nickas, Precast/Prestressed Concrete Institute

2015 NATIONAL ABC CONFERENCE

TECHNICAL SESSIONS



MONDAY, DECEMBER 7

MONDAY, DECEMBER 7					
8:00 – 10:00 AM	GENERAL SESSION				
10:00 AM TO 10:30 AM COFFEE BREAK AT EXHIBIT HALL					
10:30 AM – NOON	STATE ABC EXPERIENCES	LATERAL SLIDE CASE STUDIES	RE-USE OF EXISTING SUBSTRUCTURES FOR ABC PROJECTS	ABC RESEARCH	ABC CONSTRUCTION SOLUTIONS
12:00 PM TO 1:00 PM LUNCH BREAK - EXHIBIT HALL - CASH BUFFET					
1:00 – 3:00 PM	EVALUATION AND MONITORING OF ABC BRIDGE MOVES	LATERAL SLIDE CASE STUDIES	PBES CONNECTION DETAILS AND MATERIALS	ABC RESEARCH	ADVANCED MATERIALS FOR ABC
3:00 PM TO 3:30 PM COFFEE BREAK - EXHIBIT HALL					
3:30 – 5:30 PM	STATE ABC EXPERIENCES	ABC BRIDGE DECK CASE STUDIES	ABC APPLICATION FOR RETROFIT	ABC RESEARCH	SHRP2 R04 RELATED PROJECTS

TUESDAY, DECEMBER 8

8:00 – 10:00 AM	STATE ABC EXPERIENCES	ADVANCING SEISMIC RESEARCH FOR ABC	ABC CASE STUDIES	PROMOTING ABC	MISCELLANEOUS
10:00 AM TO 10:30 AM COFFEE BREAK - EXHIBIT HALL					
10:30 AM – NOON	ABC PROJECTS WITH GRS-IBC	ABC PROJECTS USING SPMT	ABC CASE STUDIES	ABC RESEARCH	MISCELLANEOUS
12:00 PM TO 1:30 PM LUNCH BREAK - EXHIBIT HALL - CASH BUFFET					
1:30 – 4:00 PM	STATE ABC EXPERIENCES	ADVANCING SEISMIC RESEARCH FOR ABC	ABC SUBSTRUCTURES SOLUTIONS	DESIGN OF ABC PROJECTS FOR SERVICE LIFE	ADVANCEMENT OF PREFABRICATED BRIDGE ELEMENTS

2015 NATIONAL ABC CONFERENCE

BEST PROJECT AWARDS

Best Project – PBES: Rochester Fast 4 Project in Rochester, VT

Owner:

- Vermont Agency of Transportation

General Contractor:

- W.M. Schultz Construction, Inc.

Designer:

- VHB

Additional Contributors:

- J.P. Carrara & Sons, Inc. – Precaster

Contracting Method:

- Design-Bid-Build



Best Project – SPMT: Hastings Bridge Project in Hastings, MN

Owner:

- Minnesota Department of Transportation

General Contractor:

- Lunda Construction and Ames Construction

Designer:

- Parsons

Contracting Method:

- Design-Build Best Value Joint Venture



2015 NATIONAL ABC CONFERENCE

BEST PROJECT AWARDS

Best Project – Lateral Slide: I-84 over Dingle Ridge Road in Brewster, NY

Owner:

- New York State Department of Transportation

General Contractor:

- Marino Crane

Designer:

- HNTB Corporation

Additional Contributors:

- NYSDOT Region 8 – Highway Design
- Dailey Precast – Precast Concrete Fabricator
- Siefert Associates – Contractor's Erection Engineer
- Parsons Brinckerhoff – Construction Inspection
- Genesis Structural Engineering – HNTB's Erection Engineering Sub-consultant

Contracting Method:

- Design-Bid-Build



Honorable Mention – PBES: I-75 Caloosahatchee Bridge in Ft. Myers, FL

Owner:

- Florida Department of Transportation

General Contractor:

- de Moya/Leware, JV

Designer:

- Stantec/HDR

Additional Contributors:

- Eisman & Russo
- Kinard-Stone, Inc.
- HighSpans Engineering

Contracting Method:

- Design-Build-Finance



2015 NATIONAL ABC CONFERENCE

BEST PROJECT AWARDS

Honorable Mention – Lateral Slide: M-50 Bridge over I-96 Bridge in Lowell Township, MI

Owner:

- Michigan Department of Transportation

General Contractor:

- Anlaan Corporation

Designer:

- Parsons for Bridge Slide Design – MDOT for Structure Design

Additional Contributors:

- HH Engineering, Ltd.

Contracting Method:

- Qualifications Based Selection; Construction Manager / General Contractor



2015 NATIONAL ABC CONFERENCE AWARDS

MOST INFLUENTIAL PERSON CONTRIBUTING TO THE CAUSE AND IMPLEMENTATION OF ABC



Michael P. Culmo, P.E.

Vice President of Structures and Transportation
CME Associates, Inc., East Hartford, CT
Culmo@cmeengineering.com

Mike Culmo has been involved with the design and advancement of ABC for 30 years. He began his career in 1983 at the Connecticut DOT after receiving his BSCE from the University of Connecticut. He was lead designer for ConnDOT's first major ABC project, a 6-span curved bridge that carries ramp traffic from Interstate 84 to Connecticut Route 8. The bridge, built in 1990, has a full-depth precast concrete deck panel system that continues to perform well today.

Mr. Culmo completed his M.S. in Structural Engineering from the University of Connecticut in 1986. He moved to CME in 1996 and has designed a number of ABC projects while there. For example, he was responsible for preliminary design and was the owner's representative for the Massachusetts DOT's 93Fast14 Bridge Replacement Project in the city of Medford. This \$100 million design-build project involved the replacement of 41 spans during 10 weekend closures. Mr. Culmo is also actively promoting ABC in his national organization and committee activities and has written various ABC-related documents (e.g., articles and manuals) for FHWA and other organizations. Mike has presented numerous ABC-related presentations both nationally and internationally.



Award recipient Mike Culmo with Carmen Swanwick, AASHTO SCOBS T-4 Chair, and Dr. Atorod Azizinamini, ABC-UTC Director

WHITE HOUSE CHAMPION OF CHANGE AWARD

In October 2015, the White House and the U.S. Department of Transportation recognized Dr. Azizinamini, Director of the ABC-UTC, as a 2015 *Champion of Change: Transportation Innovator* in a ceremony held at the White House. The Director of the ABC-UTC was recognized for developing the Folded Steel Plate Girder (FSPG) system that is providing a cost-effective ABC solution for short-span bridges (less than 60 feet long). The ABC application of the FSPG consists of bending a flat steel sheet to a pre-determined shape to form the girder, and casting concrete on top of the girder. Several pre-topped modules are then transferred to the bridge site and joined together using a deck closure joint. The first FSPG bridge to be opened to traffic was in Uxbridge, Massachusetts, through collaboration with MassDOT. It received the best bridge design award in the short-span category in AISC's 2014 bridge competition. Pennsylvania, with the help of CDR Bridge Systems (www.cdrbridges.com), is building seven FSPG bridges; construction of these bridges will be completed by 2017.



Dr. Atorod Azizinamini with Transportation Secretary Anthony Foxx, during October 13, 2015 award ceremony in White House



Installation of folded steel plate girder system at Uxbridge, Massachusetts

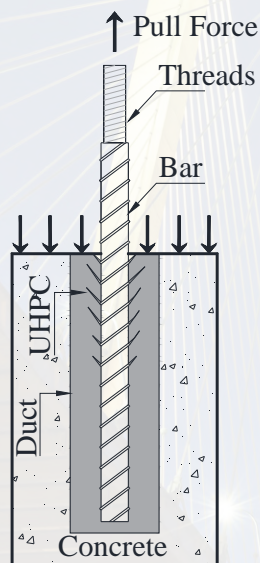


COMING IN 2016!



GRADUATE STUDENT SEMINARS

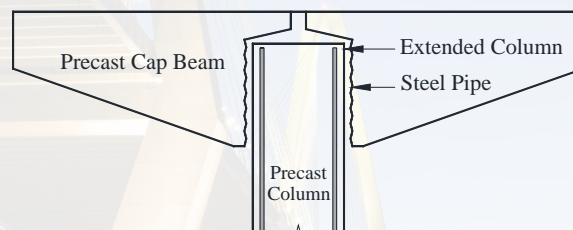
The ABC-UTC will initiate web-based Graduate Student Seminars in 2016. These quarterly seminars will highlight graduate students' contributions to ABC-related research projects in which the students worked. Specifically, presentations will provide overviews of the ABC aspects of the research projects, the projects' connection to the ABC-UTC, and the students' tasks in the projects. A strong emphasis in the presentations will be the ABC products coming out of the research projects for implementation. Seminars will be one hour in length and consist of two 20-minute graduate student presentations, each followed by a 10-minute Q&A session. Stay tuned!



UHPC-Filled Duct Connections



Headed Shape Memory Alloy Bars



Pocket Connections

Ex: Application of Advanced Materials and New Detailing for ABC Column Connections

ISU BRIDGE BUILDING COMPETITIONS

Several bridge building competitions will occur. These will include ISU's Women in Science and Engineering (WiSE) program, which encourages young women to pursue careers in STEM and hosts a competition aimed at area elementary, middle, and high schools as well as a special category for families.

IOWA STATE UNIVERSITY
Institute for Transportation

UNR SUMMER CAMP – JUNE 2016

Two summer camps are scheduled to be held UNR in June 2016 for middle school students. The focus of the camp is on engineering studies. Two hours of each camp will be dedicated to bridge engineering and application of ABC in seismic zones, including one hour of lecture and one hour of shake table laboratory visit.



University of Nevada, Reno

FIU BRIDGE AND WIND ENGINEERING TEACHER WORKSHOP

A two day teacher workshop will be held at FIU in July 2016 for middle school and high school level teachers. The focus of the camp is on bridge engineering, ABC, corrosion, and wind engineering. The teachers will work with FIU faculty in these areas to develop materials and activities for use in their classrooms. Developed materials will be made available on the ABC-UTC website.



INVITATION TO THE 2017 NATIONAL ABC CONFERENCE

MARK YOUR CALENDAR!

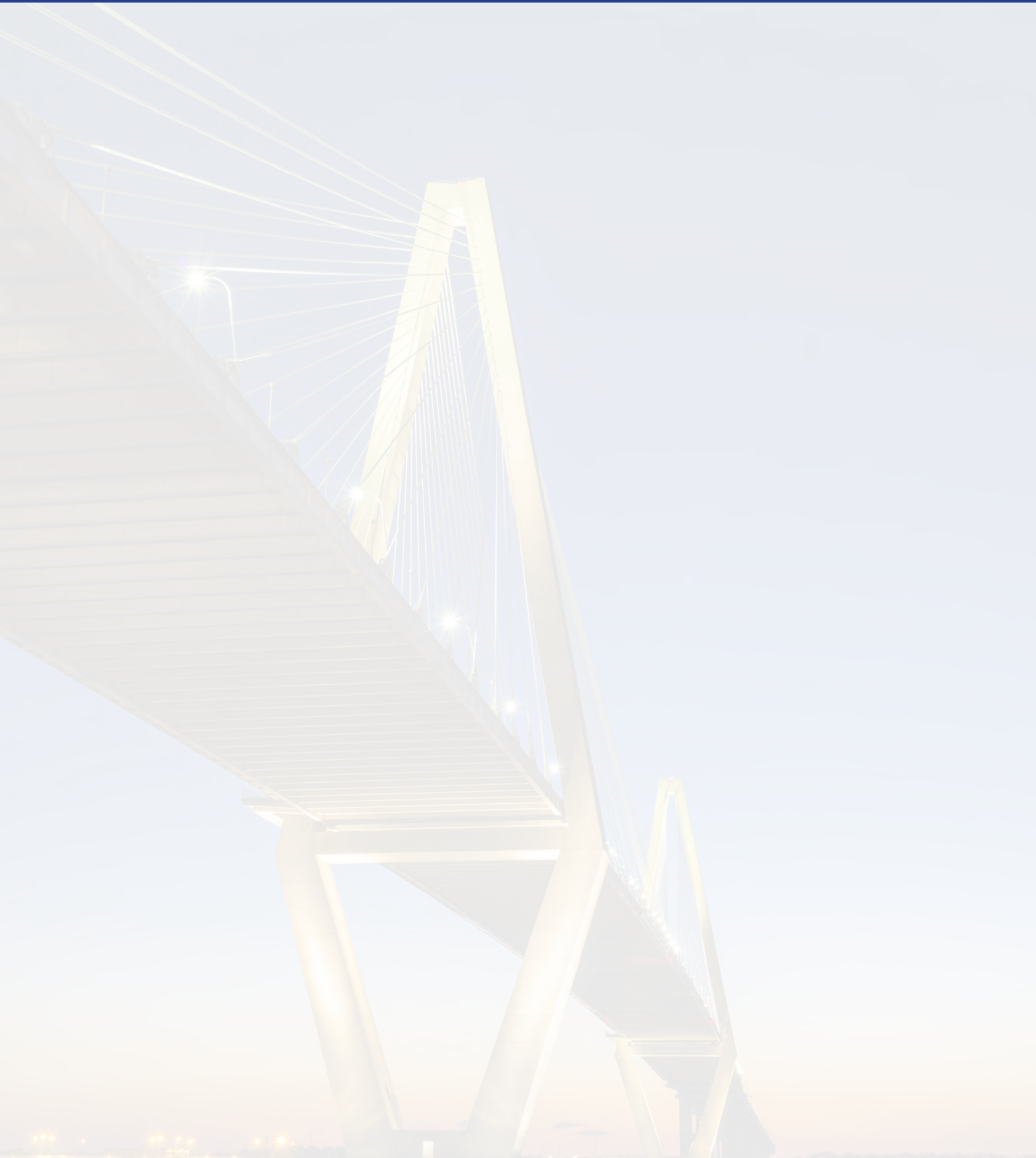
2017 National Accelerated Bridge Construction Conference
December 7 and 8, 2017: Conference
December 6, 2017: Workshops
Miami, FL



Please mark your calendars for the third National ABC Conference sponsored by the ABC-UTC to share the most current knowledge and technologies related to ABC. The Conference will be held December 7-8, 2017, in downtown Miami, Florida. Pre-conference workshops will be held on December 6, 2017.

Please plan to join us as we work together to successfully implement ABC nationwide!

VISIT [WWW.ABC-UTC.FIU.EDU](http://www.abc-utc.fiu.edu) FOR UPDATED INFORMATION





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University of Nevada, Reno