

# 2019 International ABC Conference – Pre-Conference Workshop

## W-5: ABC in Seismic Regions: Research and Implementation

Wednesday, December 11, 2019 – 1:00 p.m. to 5:00 p.m.

### Introduction:

The focus of this workshop is performance of bridges built using ABC technologies in moderate-to-high seismic regions, with emphasis on seismic performance of connections. Developing seismic resilient connections that can accommodate inelastic deformations is the primary challenge for ABC in seismic regions. This workshop exhibits ABC technologies with self-centering precast concrete columns in seismic regions. Recent innovations in bridge design, materials, and construction meeting the post-earthquake functionality and serviceability requirements are presented. The workshop provides an opportunity for exchange of the latest information in research and implementation of ABC in seismic regions.

### Workshop Organizer and Moderator:

Bijan Khaleghi, Ph.D., P.E., S.E., Washington State Department of Transportation

### Program:

1:00 p.m.	Welcome and Introduction to Workshop	Moderator – Bijan Khaleghi, Ph.D., P.E., S.E.
1:05 p.m.	Economical Steel Bridge Systems for Seismic Regions	Atorod Azizinamini, Ph.D., P.E.
1:30 p.m.	Innovations in Seismic Resiliency of Accelerated Bridge Construction in Washington State	Mark Gaines, P.E.
1:55 p.m.	An Integrated Erecting Technique for Total Prefabricated Bridge Elements	Changjiang Wang, Ph.D.
2:20 p.m.	Concrete Filled Steel Tubes (CFST) for ABC of Bridge Piers and Foundations	Charles Roeder, Ph.D.
2:45 p.m.	Earthquake Resistance of Precast Bridge Substructures in China, from Research to Practice	Junfeng Jia, Ph.D.
3:10 p.m.	<i>Break</i>	
3:20 p.m.	Non-emulative Low Damage and Emulative Cast-in-Place Connections for ABC in Moderate-to-High Seismic Regions	Mustafa Mashal, Ph.D., P.E.
3:45 p.m.	Concrete Filled Steel Tubular Structure for ABC Applications in Seismic Area	Bikun Fan, Ph.D. Ling Kang, Ph.D.
4:10 p.m.	Ground Motion Selection for Seismic Design and Analyses of Bridge Structures	Anoosh Shamsabadi, Ph.D., P.E.

4:35 p.m. Selected NCHRP ABC Projects Update

Waseem Dekelbab, Ph.D., P.E.  
Bijan Khaleghi, Ph.D., P.E., S.E.

5:00 p.m. Adjourn

## **Speakers & Bios, W-5: ABC in Seismic Regions: Research and Implementation**

### **Bijan Khaleghi, Ph.D., P.E., S.E.,** [Khalegb@wsdot.wa.gov](mailto:Khalegb@wsdot.wa.gov) **(Organizer & Moderator)**

Bijan is State Bridge Design Engineer with the Washington State DOT's Bridge and Structures Office, and adjunct professor at Saint Martin's University. He is a member of AASHTO Technical Committees on Movable Bridges (T-8), Concrete Bridges (T-10), Tunnels (T-20), and member representative of AASHTO at the Permanent International Association for Road Congress (PIARC). Bijan is a member of the TRB ABC Joint Subcommittee (AFF00(2)) and the Concrete Bridges Committee (AFF30) as well as other organizations.

### **Atorod Azizinamini, Ph.D., P.E.,** [aazizina@fiu.edu](mailto:aazizina@fiu.edu) **(Co-Organizer)**

Atorod is Professor and Chair of the Civil and Environmental Engineering Department and Director of the ABC-UTC at FIU. He has led multiple research studies in the earthquake engineering field in both bridge- and building-related topics. His current research studies include development of economical steel bridge systems suitable for seismic areas in conjunction with ABC. Atorod was part of the U.S. research team during the U.S.-Japan cooperative work in earthquake engineering. He has multiple publications.

### **Waseem Dekelbab, Ph.D., P.E.,** [WDekebab@nas.edu](mailto:WDekebab@nas.edu)

Waseem joined TRB as a Senior Program Officer in November 2008 and primarily manages NCHRP bridge-related research projects. Before joining NCHRP, he worked at the Turner-Fairbank Highway Research Center as principal investigator of the Bridge Management Information Systems laboratory supporting the Long-Term Bridge Performance Program while employed by Science Applications International Corporation under contract with FHWA. Waseem has led many consulting forensic projects using Finite Element analysis and is a co-author of several bridge research reports and papers.

### **Bikun Fan, Ph.D.,** [370236201@qq.com](mailto:370236201@qq.com)

Bikun is senior bridge engineer with Sichuan Highway Planning, Design and Research Institute, China. She is a leading expert in concrete filled steel tubular structures, leading the design of three of the longest concrete filled steel arch bridges in the world, with spans ranging from 507m to 575m. She has pioneered applications of these structures in long spans and in seismic regions. She is a co-author for the Chinese concrete filled steel tubular structure code.

### **Mark Gaines, P.E.,** [GainesM@wsdot.wa.gov](mailto:GainesM@wsdot.wa.gov)

Mark has Bachelor's and Master's degrees in civil/structural engineering from the University of Washington. He has worked for the Washington State DOT for about 20 years. Much of his WSDOT career was at the State Construction Office serving as a bridge construction engineer. Mark currently serves as WSDOT's State Bridge Engineer. Prior to embarking on his civil engineering career, Mark spent four years working as a nuclear reactor operator on board a Trident-class ballistic missile submarine.

### **Junfeng Jia, Ph.D.,** [junfengj@unr.edu.cn](mailto:junfengj@unr.edu.cn)

Junfeng is an associate professor at the Beijing University of Technology, China, and a visiting scholar at the University of Nevada, Reno, specializing in earthquake and bridge engineering. He graduated from Harbin Institute of Technology, receiving his doctorate in 2011. Junfeng's research focus is development of engineering concepts and techniques for improved seismic performance, with primary applications in bridges. Much of his work has focused on seismic isolation and mitigation of bridges, and ABC for high seismicity areas.

**Ling Kang, Ph.D.** 370236201@qq.com

Ling is a design engineer with Sichuan Highway Planning, Design and Research Institute, China, specializing in complex bridge structure design and research. She has conducted extensive research in concrete filled steel tubular structures, particularly in structure behavior in seismic regions and connection fatigue testing. She is also involved in the design of various concrete filled steel tubular structures, such as Wenma truss bridge and Hejian arch bridge over the Yangtze river.

**Mustafa Mashal, Ph.D., P.E.**, mashmust@isu.edu

Mustafa is an Affiliated Faculty at the Center for Advanced Energy Studies in Idaho Falls, Idaho, working on projects in collaboration with the Idaho National Laboratory. He is the Director of the structural lab (SLAB) at Idaho State University. Mustafa has been involved in seismic assessment, retrofitting, and design of a variety of structures. He serves as an expert for companies in New Zealand and the United States and has authored or co-authored 50+ publications.

**Charles Roeder, Ph.D.**, croeder@uw.edu

Charles is Professor Emeritus, Department of Civil Engineering at the University of Washington. He has been a member of the faculty there for 40+ years. He has performed extensive research on the seismic performance of steel and composite structures.

**Anoosh Shamsabadi, Ph.D., P.E.**, anoosh\_shams@yahoo.com

Anoosh is widely recognized for his work on structural and geotechnical earthquake engineering. He has more than 33 years of professional and teaching experience in bridge engineering, geotechnical earthquake engineering, and construction engineering. Anoosh is Chair of the Bay Area Rapid Transit (BART) Technical Advisory Panels (TAP) and is member of California High Speed Rail Authority TAP for Seismic design and Analysis Bridge Structures, Tunnels, Earth Retaining Systems, Buildings, and Geotechnical and Construction criteria.

**Changjiang Wang, Ph.D.**, 1210725965@qq.com

Changjiang is the director of the Bridge and Structure Branch of the China Civil Engineering Society. He is currently vice president of the Zhejiang Transportation Design and Research Institute and senior engineer at the professor level. He led a design and research team for large bridges in Zhejiang Province, China. In 2016, he was selected as a scientific and technological innovation leader in the Department of Transportation and enjoyed the special allowance expert of the State Council in China.