



ACI 341 - EARTHQUAKE-RESISTANT CONCRETE BRIDGES
Sunday, Mar. 27, 2022
 Orlando, FL (all times EDT)

HIGHLIGHTS

- 1.) Behavior, Design, Analysis and Construction of Nonconventional/Atypical Reinforced Concrete (RC) Columns/Piers (Monday 8:30-10:30 and 11:00-1:00 PM, C-Boca IV)
- 2.) First in-person meeting since Fall of 2019.

MAIN COMMITTEE

341 Main Committee Sunday 3/27 3:00 PM-5:00 PM C-Curacao 3

SUBCOMMITTEES

341-A Columns Sunday 3/27 10:00 AM-11:30AM C-Bonaire 5
 341-B Pier Walls N/A
 341-C Retrofit Sunday 3/27 11:30 AM-1:00PM C-Bonaire 3
 341-D PBSE Sunday 3/27 1:30 PM-3:00PM C-Grand Sierra I

OTHER BRIDGE COMMITTEES and SESSIONS

342 Bridge Evaluation Sunday 3/27 8:30 AM-11:00AM C-Boca VI
 343 Bridge Design Monday 3/28 10:00 AM-12:00 PM C-Antigua 3
 345 Bridge Construction Sunday 3/27 1:30 PM - 3:30 PM C-Curacao 1
 UHPC in Bridges – 3 Part Session, Monday 11AM-6PM C-Boca III

MEETING AGENDA

- 1) Call to order and introductions – 8 Minutes
- 2) Approval of the meeting agenda – 1 Minute
- 3) Review and approval of the Atlanta/Virtual minutes – 1 Minute
- 4) Technical presentation 1 (15 Minutes)
- 5) Subcommittee breakout discussions (20 minutes) (brief introduction of the four subcommittees and objectives)
 - Plans regarding possible future sessions.
 - Current business regarding documents.
 - Future directions
 - Define scope / schedule / time resource / leader for any action item.**
- 6) Subcommittee and breakout reports – 12 minutes each
 - a) Performance Based Seismic Design of Bridge Columns (ElGawady)
 - b) Wall Piers (Mackie)
 - c) Retrofit and Repair (Alam) – including Ballot discussion, special publication status
 - d) Performance Based Seismic Design of Bridges (Marsh)

For all of the above, define scope / schedule / time resource / leader.

- 7) Technical presentation (20 Minutes). Jessi Thangjitham “**Bond-slip failure of bridge columns under seismic loads**” (abstract at the end).
- 8) Future directions, Update from TAC – Robert Frosch, and other business – 7 Minutes

Fall 2022 – Theme TBD

October 23-27, Hyatt Regency Dallas, Dallas, TX

- Preliminary session request: October 22, 2021
- Final session request: April 1, 2022
- Approved sessions

Component and System Level Seismic Performance Evaluation of Bridges Under Mainshock-Aftershock Ground Motion Effects ACI Fall Convention 2022 - Dallas, TX

Loading Protocols for Seismic Performance Evaluation of Structural Components, Part 1 of 2 ACI Fall Convention 2022 - Dallas, TX

Loading Protocols for Seismic Performance Evaluation of Structural Components, Part 2 of 2 ACI Fall Convention 2022 - Dallas, TX

New AASHTO Performance-Based Seismic Design Guidelines ACI Fall Convention 2022 - Dallas, TX

Spring 2023 – Theme TBD

April 2-6, 2023, San Francisco, CA, Hilton San Francisco Union Square

- Preliminary session request: April 1, 2022
- Final session request: October 28, 2022
- Proposed sessions ?

Fall 2023 – Theme TBD

October 29-November 2, 2023, Boston, MA, Boston Convention Center & Westin Boston Waterfront

Spring 2024 – Theme TBD

March 24-28, 2024, New Orleans, LA, Hyatt Regency New Orleans

Fall 2024 – Theme TBD

November 3-7, 2024, Philadelphia, PA, Marriott Philadelphia Downtown

Spring 2025 – Theme TBD

March 30-April 3, 2025, Toronto, Ontario, Canada, Sheraton Centre Toronto

Fall 2025 – Theme TBD

October 26-30, 2025, Baltimore, MD, Hilton Baltimore & Marriott Baltimore Inner Harbor

Spring 2026 – Theme TBD

March 29-April 2, 2026, Rosemont/Chicago, IL, Hyatt Regency O'Hare

Deadlines for Technical Session Requests Shown Below

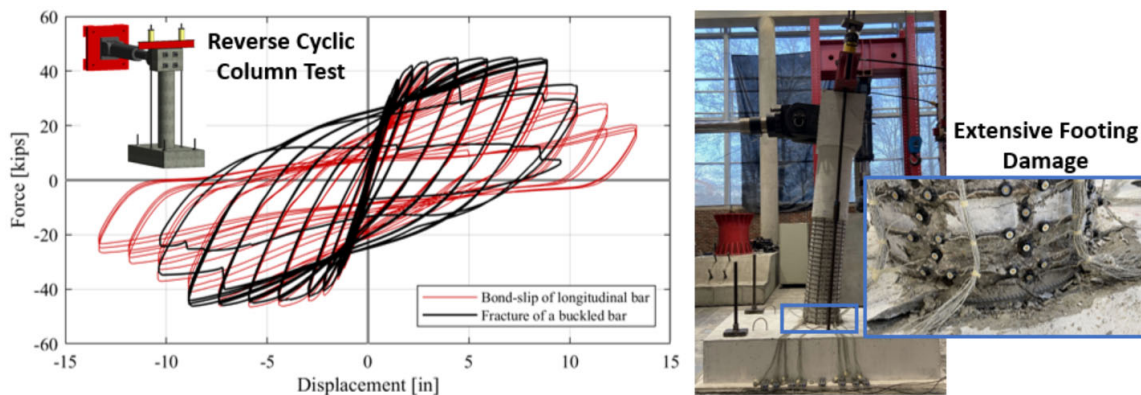
	Orlando, FL Spring 2022 March 27-31, 2022	Dallas, TX Fall, 2022 October 23-27, 2022	San Francisco, CA April, 2023 April 2-6, 2023	Boston, MA Fall, 2023 October 29 - November 2, 2023	New Orleans, LA Spring, 2024 March 24-28, 2024	Philadelphia, PA Fall, 2024 November 3-7, 2024	Ontario, Canda Spring, 2025 March 30-April 3, 2025	Deadline Requirements
								<i>Please contact staff if the deadlines cannot be met</i>
Preliminary Session Request	April 2, 2021	October 22, 2021	April 1, 2022	October 28, 2022	April 7, 2023	November 3, 2023	April 29, 2024	Friday after the Convention one year before the Session
Call for Papers in <i>Concrete International</i> requested	November 25, 2020	June 23, 2021	December 1, 2021	June 29, 2022	December 24, 2022	July 5, 2023	December 30, 2023	16 Months before the Session
All Abstracts received by Moderator	July 26, 2021	February 21, 2022	August 1, 2022	February 27, 2023	August 24, 2023	March 4, 2024	August 29, 2024	8 Months before the Session
(Co)Moderator Training completed	October 17, 2021	March 27, 2022	October 23, 2022	April 2, 2023	October 29, 2023	April 24, 2024	November 3, 2024	At least one Convention before the Session
Final Session Request	October 22, 2021	April 1, 2022	October 28, 2022	April 7, 2023	November 3, 2023	April 29, 2024	November 8, 2024	Friday after the preceding Convention (late submissions cannot be accepted)
SP Preliminary Request if it is to be available at Session	September 25, 2020	April 23, 2021	October 1, 2021	April 29, 2022	October 24, 2022	May 5, 2023	October 30, 2023	18 Months before the Session
SP Final Material if it is to be available at Session	December 25, 2021	July 23, 2022	December 31, 2022	July 29, 2023	January 23, 2024	August 3, 2024	January 28, 2025	3 Months before the Session
SP Final Material if produced after Session	September 25, 2022	April 23, 2023	October 1, 2023	April 28, 2024	October 23, 2024	May 4, 2025	October 29, 2025	6 Months after the Session at the latest

Bond-Slip Failure of RC Bridge Columns under Seismic Loads

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The damage of seismic members occurs in locations of inelastic deformation, known as plastic hinges, which act to dissipate energy. Through mindful detailing for the anticipated seismic demands, these locations are designed to fail in flexure through plastic rotation of the hinge [1]. In an extensive experimental program, large-scale reverse cyclic tests have been conducted on bridge columns reinforced with Grade 80 steel to quantify the seismic performance. The typical failure mode of these tests has been the fracture of previously buckled longitudinal reinforcing bars. Conversely, out of the 16 tests, one column experienced a bond-slip failure due to extensive concrete crushing at the foundation level. The longitudinal bars debonded from the concrete in the damaged area, causing them to become less restrained and slip as the column was cyclically loaded. As a result, the column was able to displace significantly, but the force required to deform the column decreased at every cycle. This study explores the implications of bond-slip failures on the seismic performance of columns reinforced with Grade 80 steel.



Hysteretic Response of Column Tests & Bond-Slip Damage: Comparison of two identical tests with different types of Grade 80 steel that resulted in different failure mechanisms

Keywords (seismic, RC column, bond-slip, grade 80 steel, large-scale)

References

[1] M.J.N. Priestley, F. Seible, and G.M. Calvi, *Seismic Design and Retrofit of Bridges*. 1996.